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THE MANAGEMENT OF JAUNDICED PATIENTS

Consideration of the Indications for Surgical Treatment

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Friedrich Theodor Frerichs,[1] whose "Clinical treatise on diseases of the liver" is one of the neglected classics of medicine, began his discussion of the management of jaundiced patients with the sentence: "In the treatment of jaundice the first point to be considered is the causes which have led to the accumulation of bilious matter in the blood." There is no panacea for jaundice and the first problem is, as it was in the time of Frerichs, that of ascertaining the pathologic mechanisms involved in the particular case.

While many excellent classifications of jaundice have been advanced, one which represents an oversimplification of the problem is best suited as an approach to the subject of therapeutics. It is that of McNee,[2] who regarded jaundice as hemolytic, hepatocellular or obstructive. The hemolytic varieties may be recognized by appropriate studies of the blood and of the products of breakdown of hemoglobin. Evidence of serious hepatic dysfunction is usually absent. For these reasons, such cases seldom present a major problem in differential diagnosis. The obstructive types may be identified by the signs and symptoms of interference with biliary flow, such as colic, intermittent or permanent acholia and retention in the blood of biliary constituents other than bilirubin. Considered in the mass, obstructive jaundice seldom presents serious evidence of disturbed hepatic function unless it is of long duration. Hepatocellular jaundice does not present, as a rule, any evidence of interference with biliary flow into the intestine, and, in contrast to the aforementioned types, it shows early and conclusive evidence of interference with the metabolic and other functions of the liver. It is on these diagnostic premises that a differentiation sufficient for therapeutic purposes may be made.

The most troublesome diagnostic problem is presented by the patient whose jaundice was initiated without severe pain. It is of particular importance to concentrate attention on this type of case today because of the worldwide dissemination of infectious hepatitis which has occurred during World War II, the frequently reported incidence of homologous serum jaundice subsequent to the use of blood and plasma and the apparently increased frequency of portal cirrhosis. These are distinctly medical disorders in which surgical treatment has no place, but unfortunately they may be confused clinically with the painless, obstructive variety of icterus due to tumors of the papilla of Vater and head of the pancreas, to the treatment of which the Whipple operation has been applied with such encouraging results.

A great many diagnostic short cuts have been suggested for the differentiation of obstructive and hepatocellular jaundice, most of which are based on the previously mentioned fact that gross disturbances of hepatic function occur early in the course of primary hepatic disease and late when there is obstruction of the extrahepatic biliary passages. The hepatic functional tests commonly used in this differentiation appear in the accompanying table. They constitute part of the "profile" study suggested by Watson and his associates[3] and, if used with an understanding of their limitations, are clinically valuable. However, any one whose experience with jaundiced patients has been at all extensive can recall many cases of both obstructive and intrahepatic jaundice in which the observations were at considerable variance with this table. One rather cynical observer has remarked that the greatest value of hepatic functional studies lies in the fact that the time required for their performance gives one the opportunity to take a complete history and to examine the patient. Perhaps it would be fairer to say that the tests are as good as the clinical abilities of the user.

In the doubtful case of painless obstructive jaundice the proof is in the demonstration of actual biliary obstruction. Of considerably more clinical importance, therefore, is the remaining portion of the "profile" series of tests, which include studies on urinary and fecal urobilinogen.[4] Data from these studies give reliable information in regard to the patency of biliary passages and, incidentally, will detect the presence of excessive hemolysis. Formerly clinicians depended to a considerable extent on the chemical analysis of the stools for bile pigment and on the use of duodenal intubation in the diagnosis of obstruction of the biliary passages. Positive results from these sources are reliable, but negative information is considerably less so. A bulky stool with a low bilirubin content will give a negative Schmidt test, and a negative result of examination of the duodenal contents for bile may be due to technical error in the location of the tube.

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1. Frerichs, F. T.: A Clinical Treatise on Diseases of the Liver, translated by C. Murchison, New York, William Wood & Company, 1879.
2. McNee, J. W.: Jaundice: A Review of Recent Work, Quart. J. Med. **16**: 390-420 (July) 1923.
3. Hoffbauer, F. W.; Evans, G. T., and Watson, C. J.: Cirrhosis of the Liver: with Particular Reference to Correlation of Composite Liver Function Studies with Liver Biopsy, M. Clin. North America **29**: 363-388 (March) 1945.
4. Watson, C. J.: Studies of Urobilinogen: III. The Per Diem Excretion of Urobilinogen in the Common Forms of Jaundice and Disease of the Liver, Arch. Int. Med. **59**: 206-231 (Feb.) 1937.

Stokes,[5] who is now studying the reliability of all methods for determining the existence of biliary obstruction, has permitted me to mention some of his preliminary studies. When no bile was obtained by duodenal drainage in his patients, the position of the tube was checked roentgenologically. In 78 per cent of cases the tube was found to be in the stomach rather than in the duodenum. Even when duodenal drainage did not produce bile, determinations of urobilinogen in the stools showed values above the range of complete obstruction in 53 per cent of the cases studied by him. In 5 instances in which there was absence of bile in the duodenum on drainage and roentgenologic examination showed the tube to be in the duodenum, the urobilinogen in the stool was above the range of malignant obstruction and, in fact, within the normal range in 4 of the 5 cases. In no instance was duodenal drainage positive for bile when the urobilinogen in the stool was in the range of complete obstruction.

These observations indicate clearly that the only physiologically satisfactory proof of complete biliary obstruction (which is, of course, the rule in occlusion of the biliary passages by malignant lesions) lies in the demonstration of exceedingly low levels of fecal and urinary urobilinogen. While such studies are tedious they seem definitely in order when one is considering a procedure of such magnitude as the Whipple operation for pancreatic cancer.

Results of Hepatic Functional Tests in Obstructive Jaundice and in Hepatocellular Jaundice

Test	Type of Jaundice	
	Obstructive	Hepatocellular
Plasma cholesterol	Elevated	Normal or low
Alkaline phosphatase	Increased	Normal
Serum protein	Normal	Reduced; reversed albumin-globulin ratio
Thymol turbidity	Negative	Positive
Cephalin-cholesterol flocculation test	Negative	Positive
Excretion of hippuric acid	Normal	Decreased
Effect of vitamin K on prothrombin time	Prompt	Delayed or absent

One may, then, recommend as necessary for diagnosis the battery of functional tests which constitute the "profile" series of Watson. They are not intended to substitute for clinical judgment, but their use definitely extends the range of diagnostic accuracy in the doubtful case; as a supplement to careful clinical study they leave little margin for error. In addition to their usefulness in the detection of complete biliary obstruction and hemolytic icterus they may give one assurance in advising an exploratory operation when there is equivocal clinical evidence of primary hepatic disease in patients suspected of having stone in the common duct.

SURGICAL INDICATIONS

Comments on surgical indications by one whose primary interest lies in the field of medicine may at first glance seem impertinent. These are offered only as opinions, which may well be challenged. Surgeons have at times been swayed by Moynihan's [6] dictum of an earlier epoch, that "no man living is infallible in the diagnosis of jaundice." They have accordingly been inclined to explore the biliary passages under circumstances which give little hope of benefit and which entail considerable risk. The surgeon can effect a cure only if there is mechanical interference with the extrahepatic flow of bile; no amount of external biliary drainage can reasonably be expected to improve hepatocellular damage. The surgical consultant ought, therefore, to insist on reasonable proof of mechanical biliary obstruction, partial, intermittent or complete, before undertaking the task of exploring the biliary passages of a jaundiced patient. Such proof depends not only on the presence of such familiar signs and symptoms as colic, a distended gallbladder, an external biliary fistula or complete acholia but on the assurance that any evidence of diminished hepatic function is minimal or at least consistent with the duration of the patient's jaundice. Hence, what I consider to be the indications for surgical treatment and the relative contraindications against it will be considered separately.

The following circumstances in connection with the presence of jaundice are considered to warrant surgical exploration of the biliary passages.

1. *A Reliable Past History of Gallstones or Colic or Both.*—The fact that the biliary passages have once been shown to contain stones is of the greatest significance. The patient whose former cholecystogram has shown multiple stones has a 13 to 20 per cent chance of having calculi in the duct also; with simple cholesterol stones or a roentgenologic diagnosis of a nonfunctioning gallbladder the probability of stones in the duct is considerably less. One should always recall that in spite of many warnings by surgical authorities the common bile duct is not explored as thoroughly or as often as it should be. Even if the ducts are free of calculi, inflammation or edema involving the gallbladder, ducts or pancreas may produce temporary jaundice in patients who have calculous cholecystitis. Hence, a previously positive cholecystogram or a history of removal of a stone-filled gallbladder, may be of great value in arriving at a decision.

It should be emphasized that jaundice due to stone may not be associated with colic; it may be unusual in its chronologic relation to the appearance of jaundice; pain, too, may be absent or atypical in character and location. If the gallbladder has previously been removed, the onset of icterus is more frequently associated with typical colicky seizures.

The story of colic in such cases should be carefully appraised and most conservatively interpreted; and one should not neglect to obtain firsthand information in regard to previous surgical treatment and roentgenologic studies. Above all, one need not under these circumstances be deterred from exploration by the absence or the atypical character of pain.

2. *Proved Intermittent Biliary Obstruction with Fever.*—Exploration in cases of proved intermittent biliary obstruction with fever is aimed primarily at the silent ball-valve stone, the symptomatology of which was so well described by Osler.[7] The rare benign tumors of bile ducts may produce a similar clinical syndrome; the same may be said of the equally uncommon primary stricture of the duct and of the more frequently encountered late postoperative stricture with incomplete obstruction of the duct. Chronic relapsing pancreatitis is another diagnostic stumbling block.

The principal diagnostic point in such cases is to be sure of one's facts, and it is expected that reasonable proof of intermittent acholia and of a "spiking" curve

5. Stokes, J. H.: Personal communication to the author.

6. Moynihan, cited by McLaughlin, C. W., Jr.: Tumours of the Extra-Hepatic Bile Ducts, Exclusive of the Ampulla of Vater, Canad. M. A. J. **28**: 255-265 (March) 1933.

7. Osler, W.: A Clinical Lecture on the Ball-Valve Gall-Stone in the Common Duct, Lancet **1**: 1319-1323 (May 15) 1897.

of serum bilirubin should be available. The greatest danger lies in the fact that patients who have chronic hepatitis, hepatic atrophy or cholangitis also may have intermittent icterus and fever. So far as possible, primary hepatic disease should, therefore, be excluded. If the liver is large, a needle biopsy may be a worth while preliminary procedure.

3. *An Associated Biliary Fistula With or Without Acholic Stools.*—The need for exploration in a case in which there is an associated biliary fistula with or without acholic stools requires no discussion; the great majority of cases are due either to postoperative stricture or to an overlooked stone in the common duct. The fistula may occasionally communicate with a subhepatic extra-ductal pocket of retained bile.

4. *Painless Jaundice Appearing Within Six Months After Cholecystectomy.*—As is generally known, in the majority of cases in which painless jaundice appears within sixty days after cholecystectomy it is due to traumatic stricture or even to accidental section of the common bile duct at operative intervention. Care must be taken to exclude homologous serum jaundice with its long incubation period of sixty to one hundred and twenty days. A negative Hanger test or the absence of thymol turbidity should give the surgeon assurance on this latter point.

5. *Proved Complete and Permanent Biliary Obstruction.*—The completeness of mechanical blockage of the bile duct due to carcinoma of the pancreas, papilla or common duct has been repeatedly emphasized. It is in this type of case that radical resection of the obstructing lesion has been performed with such gratifying results. The prime consideration here is the proof of complete occlusion, with permanent absence of bile in the stool. The corroborative value of determinations of urobilinogen in stool and urine has already been mentioned. Palpation of the distended gallbladder, now almost a lost art, is also of great diagnostic value. Both the surgeon and the patient should be prepared for a most extensive and dangerous surgical procedure. One can, as has been said, "settle for a cholecystogastrostomy," but in these times radical resection is the ultimate goal.

It is realized that these indications for exploration are conservative and that the surgeon may frequently and properly decide to proceed with operative intervention on much less definite grounds. He may, for example, be quite justified in exploring the ducts of a patient with chronic jaundice who shows minimal evidence of hepatic dysfunction, and he may be rewarded by finding a surgically removable lesion, such as stone. Whether the indications are clear or not, it is believed that the relative contraindications against surgical intervention should always be given consideration in making a decision. As will appear later, these danger signals are associated either with the presence of primary hepatocellular disease or with serious hepatic damage secondary to prolonged biliary obstruction. They may not necessarily interdict exploration, but they are always worthy of review in any given case.

RELATIVE CONTRAINDICATIONS TO SURGICAL TREATMENT OF JAUNDICED PATIENTS

1. *A Recent History of Exposure to Hepatotoxic Agents.*—A routine inquiry in regard to a recent exposure to hepatotoxic agents should be made in all cases of jaundice. It is well to recall that many patients having "toxic" hepatic injury may have abdominal pain and digestive disturbances at the onset. In these times the diagnostic possibility of epidemic infective hepatitis must also be considered. In such cases, the onset of symptoms is frequently characterized by fever and abdominal pain, and in more than one case the symptoms have been tentatively regarded as being due to calculous obstruction.

2. *Transfusions or Plasma Infusions Sixty to One Hundred Days Previously.*—The danger of confusing homologous serum jaundice due to transfusions or plasma infusions sixty to one hundred days previously with that due to other causes cannot be overemphasized, since the former condition has a significant mortality rate, much of which occurs during the first week or ten days after the appearance of jaundice. Some time should be allowed to elapse before a final decision is reached in the doubtful case.

3. *Vascular "Spiders"; Visible Collateral Circulation.*—Pulsating angiomas which appear in the distribution of the superior vena cava are almost the trademark of primary hepatic disease. They occur but seldom in patients with stricture. Visible distention of the abdominal veins has a similar significance, as it indicates interference with portal blood flow.

4. *Fetor Hepaticus.*—The peculiar odor of the breath associated with hepatic insufficiency does not lend itself well to descriptive terms. It has been described as sweetish, mousy or resembling the odor of certain aromatic amines. It is especially likely to occur in the later stages of hepatic atrophy or cirrhosis and can never be safely disregarded.

5. *Edema or Pronounced Hypoproteinemia or Both.*—These findings are rare in cases of obstructive jaundice and the presence of edema or pronounced hypoproteinemia or both should always serve as a warning to the surgeon who is considering exploration.

6. *Extrahepatic Tumor Masses.*—Masses in the right upper quadrant of the abdomen projecting from the inferior surface of the liver may be due to primary carcinoma of the gallbladder or they may be due to malignant lesions of the stomach or splenic flexure, with or without hepatic metastasis. In case of doubt, appropriate roentgenologic studies and visualization of the liver by the aid of thorium dioxide sol should be carried out. The latter procedure has a special field of usefulness if metastasis or primary hepatic cancer is suspected.

7. *Decidedly Chronic Jaundice with Splenomegaly.*—Patients presenting the syndrome of decidedly chronic jaundice with splenomegaly are usually suffering from what has been described as hypertrophic or pericholangiotic biliary cirrhosis. A few may present associated lipemia and xanthomas. Many show little evidence of interference with hepatic function even after long periods. As a group, these patients are seldom benefited by any surgical procedure.

8. *Intense Jaundice with Patent Biliary Passages.*—Patients whose bilirubin levels are in excess of 25 mg. per hundred cubic centimeters of serum are most frequently afflicted with primary hepatic disease (infectious hepatitis, atrophy or cirrhosis), primary carcinoma of the liver or extensive necrosis of the hepatic parenchyma secondary to biliary obstruction.[8] Even when there is good reason to believe that the biliary passages may have been previously occluded, the surgeon should proceed with great caution and consider the results of hepatic functional studies with unusual care.

8. Snell, A. M.: Hepatic Parenchymal Lesions and Hepatic Function of Patients with Obstructive Jaundice, Tr. Am. Gastro-Enterol. A. **35**: 196-225, 1932.

9. *Evidence of Active Hemolysis.*—It is rare for either hemolytic anemia or jaundice to simulate an obstructive lesion of the biliary passages, but it should be recalled that the association of gallstones and congenital hemolytic jaundice is a common one and that occasionally patients who have cirrhosis may also present evidence of hemolytic phenomena.

10. *Greatly Reduced Cholesterol Esters or Failure of Hippuric Acid Synthesis.*—A low or falling blood cholesterol level and a diminution of the cholesterol esters to less than 50 mg. per hundred cubic centimeters of plasma are indicative of severe parenchymal hepatic injury. Hippuric acid excretion of less than 50 per cent of normal has a similar significance and indicates an increased surgical risk.

11. *Hypoprothrombinemia Refractory to Vitamin K.*—No matter how complete or prolonged mechanical obstruction to the biliary passages may be, the prothrombin deficit which results is almost invariably responsive to the oral or parenteral administration of vitamin K. In primary hepatic disease the prothrombin deficit may not be as great, but it is usually completely refractory to treatment. The effects of vitamin K therapy may, therefore, be of diagnostic value [9] and are at times sufficient to establish the diagnosis of primary hepatocellular injury, as has been mentioned in the table.

As has been said previously, these contraindications are purely relative and may on occasion be disregarded. In general, however, the presence of one or several of them in the individual case should discourage any hasty surgical intervention.

It is regrettable that no specific precautions can be taken against one of the most unfortunate happenings in the field of biliary surgery; namely, exploration performed on patients with "compensated" cirrhosis. For reasons which are as yet unknown, these patients may present themselves with biliary colic, jaundice and other features of the syndrome of stone in the common duct. The mechanism of the pain and jaundice in such cases is obscure, but the signs and symptoms may be such that even the most experienced surgeons are misled. A high index of suspicion and a search for other signs of cirrhosis are about the only available safeguards.

DIETETIC AND OTHER TREATMENT OF JAUNDICED PATIENTS

Dietetic Considerations.—A consideration of the physiologic aspects of experimentally produced hepatic injury and of the principles on which current conceptions of treatment are based is beyond the scope of this paper. The protective value of a high carbohydrate intake is too well known to require discussion here; the need for an adequate protein intake is not so generally appreciated. The fear of using protein in the diet dates back to the early studies on dogs that had Eck fistulas and the experiments of Bollman [10] on the influence of meat extractives in producing ascites. It suffices to say that these studies do not necessarily apply to the clinical field. The interdiction of fat is based on the known need for bile in the intestine to facilitate its digestion and absorption, as well as on the observed vulnerability of experimental animals maintained on high fat diets to hepatotoxins. However, a low fat diet is an unpalatable affair at best, and the tendency for the past ten years has been toward liberality in this respect. The recent report of Rivers and Hoagland [11] indicates that, even in severe infectious hepatitis, a relatively high fat intake is without harmful effect. In fact, these workers noted that recovery of weight and strength is more rapid when such diets are used.

The clinical use of choline, methionine and similar lipotropic agents is based on studies of animals maintained on deficient diets. The application of these observations to the human subject is still under investigation. Clinical results have not so far been particularly encouraging. It may be that methionine may be found to have a specific field of usefulness as a "detoxicating" agent under certain conditions, and the drug also may spare endogenous lipotropic compounds.

The requirements for specific vitamins in the presence of jaundice are not known, except in the case of vitamin K. However, the clinical picture of hepatic insufficiency presents many of the aspects of a deficiency state, which in turn may be due to inadequate absorption of vitamins, to failure of their normal metabolism or to their actual destruction in the body of the affected person. It is on this rather insecure basis that the case for vitamin therapy rests.

The Treatment of Patients Who Have Obstructive Jaundice.—Management of patients with obstructive jaundice must be highly individualized. Many patients who show minimal disturbance of hepatic function require little or no special care, while others who have been jaundiced for a long period may have sustained serious hepatic injury, which will tax one's therapeutic resources. The diet should contain at least 350 Gm. of carbohydrate and 150 Gm. of protein daily; the intake of fat may be liberalized if it is tolerated by the patient. It is rather unusual to find a patient who cannot take at least 100 Gm. of fat a day. Dextrose need not be given intravenously except when the patient is vomiting or unable to eat. The advisability of its use during the immediate preoperative and postoperative period is, however, well established.[12] The intravenous use of protein hydrolysates is believed to be unnecessary except when the patient is malnourished. Transfusions need be used only as necessary to maintain a normal level of hemoglobin. Vitamin K should be given intravenously in dextrose solutions just before operative intervention or orally, together with bile salts to insure its absorption, for a few days before the operation, and its administration should be continued during the postoperative period to compensate for the fall in prothrombin which usually occurs. Other vitamin therapy should be given only on the basis of specific indications.

Postoperative care should include fluid administered parenterally (chiefly in the form of dextrose solutions) in sufficient quantities to maintain a positive fluid balance and a normal output of urine. In this connection it is well to follow the blood protein-nonprotein nitrogen level. If it is found to be elevated, the parenteral intake of fluid should obviously be increased, since renal insufficiency is still a common postoperative development. In occasional patients, especially those with stricture and long-standing jaundice, transfusions, plasma or serum albumin will be required to maintain the level of hemoglobin and plasma proteins during

9. Lord, J. W., Jr., and Andrus, W. DeW.: Differentiation of Intrahepatic and Extrahepatic Jaundice: Response of the Plasma Prothrombin to Intramuscular Injection of Menadione (2-Methyl-1,4-Naphthoquinone) as a Diagnostic Aid, Arch. Int. Med. **68**: 199-210 (Aug.) 1941.

10. Bollman, J. L.: The Influence of Diet on the Production of Ascites, Arch. Path. **6**: 162-163 (July) 1928.

11. Rivers, T. R., and Hoagland, C. L.: Therapy of Infectious Hepatitis, Tr. A. Am. Physicians, to be published.

12. Jones, C. M.: The Treatment of Acute Hepatic Insufficiency and Its Relation to Prognosis, Am. J. Digest. Dis. **3**: 624-628 (Nov.) 1936.

the postoperative state. A high carbohydrate, high protein diet of the type described previously, with vitamin supplements as needed, should be ordered for the convalescent patient, and every effort should be made to induce the patient to eat. In fact, an adequate diet before and after surgical operation is the only special care which many patients who have obstructive jaundice require.

Treatment in the Primary Hepatocellular Forms of Jaundice.—The management of the primary hepatocellular forms of jaundice has been gradually altered since the publication of Patek's [13] reports ten years ago and is now directed chiefly at the maintenance of an optimal nutritional state, with specific treatment for such deficiencies of vitamins and protein as may occur. The diet should contain 350 to 500 Gm. of carbohydrate, 100 to 150 Gm. of protein and 100 to 150 Gm. of fat. It is the usual practice to plan the diet with the idea of deriving a considerable portion of fat and protein from vegetable sources, eggs, dairy products, beef and liver. The diet may be liberalized considerably to suit the tastes of the person concerned. The major problem is not to prescribe a diet of particular composition but to insure the ingestion of a maximal amount of nutritious food. Since many of these patients have no desire to eat and even a profound disinclination to do so, the task of feeding them is a difficult one. The diet should be measured, if necessary, and the caloric intake charted. Supplementary infusions of dextrose and protein hydrolysates are often necessary to bring up the caloric intake and to maintain fluid balance. A normal level for hemoglobin should be insured by frequent transfusions of blood.

There is increasing evidence to indicate that one of the principal features of hepatic insufficiency is a failure to metabolize ingested protein. Many patients who have primary hepatic disease have, as is generally known, significant reductions in the serum albumin with or without a compensatory rise in globulin. Not a few have albumin levels of less than 3.5 Gm. per hundred cubic centimeters of serum, a point at which ascites and edema will usually occur. The hypoproteinemia in these cases should be vigorously treated, and it has often been noted that clinical improvement will run parallel to a rising serum albumin level. The amount of plasma and serum albumin required to affect serum protein levels is large. The necessary dose of plasma is usually 500 to 750 cc. two or three times a week,[14] until a normal blood protein level is reached and 250 to 500 cc. weekly thereafter to serve as a maintenance dose. Serum albumin should be given in initial doses of 50 to 100 Gm. daily, until the serum proteins reach a safe level. A maintenance dose of 25 to 50 Gm. every few days thereafter will usually suffice.

Recent studies at the Rockefeller Institute indicate that the use of extract of liver may enhance the beneficial effects of infused protein.[14] The Rockefeller workers, using a special preparation of liver designed for intravenous use, have, by gradually increasing the amounts injected, brought the dosage up to 10 cc. two or three times a week. The material is given diluted with isotonic solution of sodium chloride and does not often produce any reaction, even if its administration is continued over fairly long periods. Crude liver extracts also have had a beneficial effect, but their use is more likely to be attended by reactions than is that of the purified extract.

The use of such lipotropic substances as choline and methionine is now in the investigative stage, and there is some rather inconclusive evidence to indicate that they may be of therapeutic value. In a recently reported series of cases [15] of infectious hepatitis the use of these substances did not shorten the course of the disease, and a personal experience of mine with patients who had homologous serum jaundice appeared to be in line with these results. However, as Beams [16] has claimed, there is a reasonable basis for the use of these substances if the patient has a large and presumably fatty liver.

In an earlier paragraph it was stated that chronic hepatic insufficiency presents many of the features of a complex deficiency disease. On this basis it is now the usual practice to supplement the treatment mentioned previously with liberal quantities of vitamins. Some source of the vitamin B complex seems to be an essential part of treatment. If powdered brewers' yeast can be tolerated it may be given in doses up to 30 Gm. three times daily, diluted in tomato juice. Many patients object to its taste, and it is necessary to depend on the various proprietary preparations of the B complex in concentrated form. Thiamine chloride and nicotinic acid should be given in liberal amounts to patients who are receiving large quantities of dextrose intravenously. These portions of the B complex enter into the composition of enzyme systems essential to the metabolism of carbohydrate and may readily be exhausted if many vitamin-free calories are given. Thiamine and nicotinic acid also apparently have a place in the treatment of hepatic coma and the encephalopathic states, although they do not by any means constitute specific remedies for these conditions.

Ascorbic acid requirements may be met by the liberal use of orange juice, which increases the palatability of the diet. Vitamin D and extra calcium salts may be added to the diet of patients who show evidence of osteoporosis. Vitamin K is apparently not utilized in the presence of primary injury of the hepatc cells, although large doses may have some effect in keeping the blood prothrombin above a critical level.

I am not aware of any specific need for vitamin A, riboflavin, pyridoxine hydrochloride, pantothenic acid or folic acid (the Lactobacillus casei factor), although they may be employed if any specific indications for their use can be demonstrated.

A final word may be said in regard to the treatment of hepatic insufficiency. It is far easier to prevent than to treat and, once it appears, there seem to be no specific remedies available other than those described previously. These should be pushed vigorously in the hope of maintaining the best possible nutritional state for the patient and allowing time for some regeneration of hepatic tissue. Anoxemia, which may be a feature in some cases of hepatic failure, appears to depend on a qualitative alteration of hemoglobin.[17] The only means of treatment known to date are to supply normal hemoglobin by transfusions of blood and to administer oxygen by appropriate means. Recent studies on cyto-

13. Patek, A. J., Jr.: Treatment of Alcoholic Cirrhosis of the Liver with High Vitamin Therapy, Proc. Soc. Exper. Biol. & Med. **37**: 329-330 (Nov.) 1937.

14. Hoagland; Kunkel; Labby, and Shank: Therapy of Infectious Hepatitis, Bumed News Letter **7**: 8-13 (May 24) 1946.

15. Hoagland, C. L., and Shank, R. E.: Infectious Hepatitis: A Review of Two Hundred Cases. J. A. M. A. **130**: 615-621 (March 9) 1946.

16. Beams, A. J.: The Treatment of Cirrhosis of the Liver with Choline and Cystine, J. A. M. A. **130**: 190-193 (Jan. 26) 1946.

17. Keys, A., and Snell, A. M.: Respiratory Properties of the Arterial Blood in Normal Man and in Patients with Disease of the Liver: Position of the Oxygen Dissociation Curve, J. Clin. Investigation **17**: 59-67 (Jan.) 1938.

chrome C [18] indicate that this substance is capable of correcting anoxemia under certain conditions, and its use in hepatic disease will, no doubt, be investigated further.

Whatever success has been attained in the treatment of acute and chronic primary hepatic disease has been achieved by following in detail the program described in previous paragraphs. Patience, persistence and attention to every demonstrable abnormality of metabolism are necessary. The results in such hitherto hopeless conditions as portal cirrhosis have been highly encouraging, and not a little of the improvement in surgical results may be due to the application of these principles.

SUMMARY AND CONCLUSIONS

Success in the management of jaundiced patients appears to depend on increased accuracy of diagnosis, especially in the differentiation of obstructive from hepatocellular jaundice. The value of "profile" hepatic functional studies, especially those concerned with urobilinogen metabolism, is discussed.

The indications for surgical intervention in cases of jaundice include (1) the proved or presumed presence of stone, (2) the development of jaundice after cholecystectomy, (3) the presence of associated biliary fistulas and (4) proved complete acholia. The relative contraindications for surgical treatment are discussed with reference to the signs and symptoms of serious primary or secondary hepatocellular injury.

The established principles of medical treatment include a highly nutritious diet, the maintenance of normal hemoglobin and protein levels, the use of vitamins for the correction of specific deficiencies and the employment of lipotropic substances and liver extract.

ABSTRACT OF DISCUSSION

Dr. Ralph Adams, Boston: The common duct has been explored in 35 per cent of the patients operated on for gallstones, which have been found in about 40 per cent of the ducts explored. Dr. Snell has clearly shown the differential diagnostic value of certain laboratory tests, particularly that of the high serum bilirubin, low prothrombin and altered urobilinogen excretion. The purely clinical diagnostic points in carcinoma of the pancreas or bile ducts are progressive jaundice, frequently accompanied by backache, and the other symptoms usually associated with jaundice. In a fourth of the cases at Lahey Clinic there have been associated stone or fibrosis, preventing enlargement of the gallbladder. Every obstructively jaundiced patient should be offered surgical therapy after suitable preparation, unless it can be proved beyond reasonable doubt that the jaundice is caused by parenchymatous hepatic disease. This implies that the surgeon undertaking the care of such a patient should be qualified to perform the pancreatic resection which may be necessary if carcinoma is found or, alternatively, should possess the judgment and the skill required to decompress the gallbladder and bile ducts and to avoid the mishaps and missteps which can seriously influence the chances that the patient may have for successful survival of later resection by a more experienced operator. Three types of decompression are used: a simple stab wound into the gallbladder for the severely jaundiced and ill patients; second, a T-tube placed very low—and let me emphasize "very low"—in the common duct, in case there be fibrosis of the gallbladder or stones, or previous removal of the gallbladder; third, and preferably, a long loop anticolic cholecystojejunostomy with jejunojejunostomy as the first stage procedure. The requirement is the relief of jaundice. The diagnosis may be left in doubt. The diagnostic aids are the diffuse dilatation of the biliary tree or palpable mass in the head of the pancreas. A radical pancreatoduodenectomy has now been done in 34 cases. In 10 cases resection was done in one stage; in 24 ot was done in two stages to gain the advantages of nutritional and chemical preparation before undertaking the radical operation. This period of preparation usually will need to be two to three weeks in length, but a longer period may be required in the presence of severe hepatic damage. An important point, 14 of the 34 patients had carcinoma of the ampulla, the type of obstruction which causes early jaundice, tends to bring the patient at an early stage to his physician and, therefore, constitutes the group in which the more favorable results may be anticipated; and, secondarily, the type of case in which the surgical intervention is easiest. Five of these 34 patients, 15 per cent, died in the hospital; 10, or 30 per cent, have subsequently died, leaving 19, or 55 per cent surviving for a period up to four years. The proper management of the jaundiced patient with carcinoma of the pancreas or bile ducts is a properly staged surgical resection.

Dr. Leon Goldman, San Francisco: In the recognition and preparation of jaundiced patients for surgical intervention a host of liver function tests may be used, and one may be informed or confused by the results of the various tests. There is no test that seems outstanding in the determination of hepatic function. Every jaundiced patient should have the test for prothrombin response to vitamin K performed, not only because of its help in the determination of whether the patient has intrahepatic or obstructive jaundice but also because of the need for knowing what the prothrombin concentration is in the blood, irrespective of whether the patient is going to be operated on. The second test of hepatic function which has definite therapeutic aid is the plasma protein determination. The finding of a low plasma albumin level, with jaundice, suggests that the patient has definite hepatic disease and that, if surgical intervention is indicated, considerable protein therapy may be necessary. One of the pitfalls of liver function tests as a differential diagnostic point in obstructive jaundice is the fact that patients with long-standing, obstructive jaundice also have some hepatic insufficiency, particularly if there is inflammation present, such as is often seen in association with calculi in the common duct. This is borne out by statistics, which show that the mortality rate of patients with stone in the common duct is from two to three times higher than the mortality rate of those patients in whom exploration of the common duct is not necessary. The mortality rate of jaundiced patients with stone in the common duct is also higher, because this operation is indicated more in the upper age groups. An attitude which has been common in the past is that if a patient has a painless type of jaundice, the physician can wait out the case and the diagnosis will show itself; if the type of jaundice is intrahepatic, the jaundice may subside, but if the patient has a malignant growth the jaundice will deepen and the patient's disease will progress. That philosophy is a thing of the past and should not be carried farther; to overlook a diagnosis of carcinoma of the head of the pancreas or carcinoma of the ampulla is to deny the patient a few years of life, or possibly even a cure from cancer of the ampulla or head of the pancreas. An early diagnosis must be made if these patients with cancer, whom Dr. Adams mentioned, are to be successfully operated on with a curative approach rather than to be given merely a sidetracking operation in a palliative manner.

Dr. I. Snapper, New York: Notwithstanding the galaxy of liver function tests which are currently used in the clinical laboratories, there are still conditions in which a new test of hepatic function seems to be in order. In patients who at the same time suffer from syphilis and from gallstones, jaundice which develops after treatment with neoarsphenamine may pose a complicated problem for differential diagnosis. In such patients it is difficult to decide whether the jaundice is due to an obstruction by a stone in the common duct or to the treatment with arsphenamine. The difficulty arises because the common functional tests, when applied to a case of jaundice due to neoarsphenamine, seem to indicate the presence of obstructive jaundice (Hanger). In this quandary the following

18. Proger, S., and Dekaneas, D.: Some Effects of Injected Cytochrome C on Myocardial and Cerebral Anoxia in Man, J. Clin. Investigation, to be published.

test has proved helpful. Administration of 6 Gm. of sodium benzoate by mouth leads in normal persons to the excretion of considerable amounts of glucuronic acid in the urine. Administration of the equivalent amount of 5 Gm. of benzoic acid to normal persons does not lead to the excretion of glucuronic acid in the urine. When, however, 5 Gm. of benzoic acid are given to patients with hepatic damage (cirrhosis of the liver, hepatitis or widespread hepatic metastases) the glucuronic acid reaction in the urine becomes strongly positive. In a gallstone patient in whom jaundice develops after neoarsphenamine therapy the excretion of glucuronates in the urine after the administration of 5 Gm. of benzoic acid indicates the presence of hepatic damage. Such a patient has no obstructive jaundice but has an arsphenamine hepatitis, even if all the other current tests seem to point to the presence of an obstruction in the common duct. In such a case operative intervention should, of course, be contraindicated because of the possible danger of hepatic necrosis after the trauma of the laparotomy. This glucuronate test after ingestion of 5 Gm. of benzoic acid can also be used in other instances in which obstructive jaundice has to be differentiated from hepatic jaundice. In regard to methionine therapy, it has been my experience that if a patient with cirrhosis of the liver and hepatic fetor takes methionine the hepatic odor becomes much more decided. Would it be possible that in some cases of hepatic cirrhosis in which deamination is impaired the administration of large doses of amino acids like methionine could give rise to excessive production of toxic metabolites, which ultimately might even precipitate cholemia?

DR. ALBERT M. SNELL, Rochester, Minn.: With regard to Dr. Adams' comments about surgical indications, I can only hope, in approaching the matter of the Whipple operation, that surgeons and internists will pool their data and their resources in the hope that we shall be able to do better. His report was most encouraging. These patients ought to be studied with unusual care preoperatively and postoperatively, if only for the sake of the record. In regard to Dr. Snapper's question about methionine, I have not had a large enough experience with it to say what effect it has on fetor hepaticus. No one knows exactly what produces this symptom, but it is known that it is of great prognostic significance. I shall certainly attempt to get more information on this point. In reference to tests of hepatic function it has been said that their greatest field of usefulness lies in giving the physician time to examine the patient and to take his history. A battery of them are being used, not because physicians are impressed with their individual value but because no one test is particularly reliable, and there is need for all the information which can be obtained concerning many jaundiced patients. As far as hepatitis due to arsphenamine is concerned, one may reasonably question its existence as a clinical entity. In many instances the etiologic factor is contamination of a syringe with human blood containing the virus of infectious hepatitis. The report from a British venereal disease clinic may be recalled, in which, by going back to the individual syringe technic, the workers were able to cause so-called arsphenamine jaundice to disappear. Apparently the condition is a form of homologous serum jaundice. At least, in almost all clinics the incidence of the disease appears to rise at about the third or fourth month after treatment has been begun, corresponding to the long incubation period. Two questions have been handed to me. Do I place any significance on an elevated value for total cholesterol? Yes, I think it means, in most instances, more or less complete biliary obstruction. There is, however, a group of disturbances of lipoid metabolism in which this value may be greatly increased, and in fact the extremely large increases in cholesterol and total lipids are often not the results of biliary obstruction but of primary lipoidosis. Another physician has asked how long the complete biliary obstructive phase of infectious hepatitis may last. So far as I know, the duration of this phase is only a matter of four to five days. There may be a few patients in whom suppression of bilirubin formation is almost complete, and these are the persons who so often have an extensive necrosis of liver cells.

INTRAVENOUS THERAPY OF CIRRHOSIS OF THE LIVER

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Investigations in recent years have made great advances in elucidating the physiology of the liver and the metabolic processes associated with this organ. The feeding of various experimental diets to animals has demonstrated that the liver is unusually susceptible to nutritional inadequacies and imbalances. The glycogen content of hepatic cells has been observed to decrease remarkably after short periods of starvation, and accumulations of fat within these cells have been produced in experimental animals by diets high in fat and by the administration of various hepatotoxins. A cirrhosis-like syndrome has been produced in animals on diets of low protein and high fat content,[1] and the ability of choline and methionine to prevent the accumulation or to accelerate the removal of hepatic fat (lipotropic effect) has been described.[2]

Studies of cirrhosis in human beings have served to emphasize the importance of the nutritional state. Rao [3] observed that cirrhosis of the liver is of relatively high incidence among Moslems, a population group which does not use alcoholic beverages but in which dietary inadequacies of various types are readily demonstrated. Therefore it seemed likely that improper diet or specific nutritional deficiencies might be factors in the causation of the disease. Later, Patek and Post demonstrated the effectiveness of a balanced and nutritious diet supplemented with vitamins of the B complex group in the treatment of cirrhosis.[4] Patients thus treated were found to have a longer survival period, and in many cases ascites and other manifestations of the disease either disappeared or decreased in severity.

Recently it has been reported that the use of choline in treating patients with cirrhosis of the liver achieves similar therapeutic results.[5]

A study of cirrhosis of the liver was initiated in the Hospital of the Rockefeller Institute for Medical Research in 1941. Investigations included attempts to evaluate the effects of treatment with a diet adequate in calories, protein, carbohydrate and fat, combined with the administration of large quantities of a crude, water-soluble liver extract given intravenously. The inclusion of liver extract in the experimental treatment was prompted by earlier reports of its apparent benefit in cirrhosis.[6]

Dr. Hoagland died Aug. 2, 1946.

From the Hospital of the Rockefeller Institute for Medical Research.

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The results of therapy at this hospital have been encouraging. Ascites, peripheral edema and other manifestations of the disease have disappeared in many instances. Tests indicate that liver function has improved during the treatment period, and there is evidence of an increase in the survival period in the group of 30 patients studied. This paper describes the treatment used and the observations made which indicate its possible therapeutic effectiveness.

PLAN OF THERAPY WITH INTRAVENOUS CRUDE LIVER EXTRACT

Since so little was known concerning the nature of the factor or factors in liver extract which might be helpful in the management of cirrhosis, it was decided to prepare an extract which was as crude as was consistent with safe administration. The intramuscular route, which is highly satisfactory when commonly-used refined or semirefined extracts of liver are administered in small doses, has proved unsatisfactory when cruder extracts are employed, especially in large dosage. Until information was acquired concerning the optimum dosage for the treatment of cirrhosis, it was thought advisable to give the extract more often and in larger quantities than had been deemed necessary in the treatment of pernicious anemia. Moreover, cirrhosis of the liver of long standing is frequently complicated by general wasting of the musculature, and unless multiple areas of muscle are used for administration of the extract it may be absorbed slowly and thereby increase the hazard of sterile abscesses developing at the site of injection. Likewise, the pain occasioned by the administration of 5 to 10 cc. of crude extract may be so intense as to compel the patient to refuse further treatment.

At the Hospital of the Rockefeller Institute these difficulties inherent in the use of liver extract intramuscularly have been overcome by the development and production over a period of years of a crude, water-soluble liver extract which can be given safely in large quantities by the intravenous route. This extract of dry powdered liver is the water-soluble, alcohol-insoluble portion (Cohn's fraction G[7]) which by permutit treatment [8] has been rendered free of pyrogens and the toxic amines and esters whose injection may occasionally produce an alarming decrease in blood pressure. Final tests of toxicity and sterility have been carried out on selected samples before administration to patients.

Since the Rockefeller formula for the preparation of the extract employed in this study has not been previously reported, it is here given.[9]

Preparation of the Extract.—Powdered liver extract, 440 Gm. (Lilly 343), are added to 1,600 cc. of pyrogen-free distilled water, and the solution is boiled with constant stirring for five minutes. While boiling, 6 cc. of tricresol is added. The mixture is then allowed to cool and is diluted to 2,000 cc. by the addition of distilled water. The material is permitted to stand in a covered glass jar at room temperature for twenty-four hours. The supernatant fluid is then siphoned off, care being exercised not to disturb the fine sediment. The clear solution is passed through a column of permutit contained in a tube of pyrex glass 130 cm. in length and 2.5 cm. in diameter. The permutit filter is made as follows: a small quantity of glass wool is placed in the bottom of the tube and a 25 cm. layer of quartz gravel or alundum, previously ignited and washed, is added; then a 60 cm. layer of permutit is placed on top of the alundum or gravel layer, distilled water being added in amounts sufficient to keep the permutit wet while it is being added to the column. Filtration is facilitated by keeping the tube filled with distilled water until the filtration of liver extract is begun. The first, or dilute, portion of the extract coming through the permutit column is discarded. It is essential that fresh permutit be used for each lot of extract or changed if at any time during the filtration of a given lot of extract a sudden rapid flow indicates that the adsorptive surface of the permutit has been exhausted. The volume of the filtered extract is determined, and 30 cc. of 40 per cent sodium hydroxide per liter is added. The p_H of the solution is carefully adjusted with dilute alkali or acid to between 8.2 and 8.3. The extract is then autoclaved in a pyrex flask, allowing twenty minutes per liter at 166 C., after which the material is filtered while hot through no. 954 Eaton and Dikeman filter paper to remove the flocculent precipitate which forms during autoclaving. Subsequent to this the p_H of the extract is 7.0 to 7.2. The material is then bottled in 10 cc. amounts in sterile vials, and rubber caps are applied. Hypodermic needles are inserted beside the stoppers in order to permit equalization of pressure during the second autoclaving, and the vials are again autoclaved for fifteen minutes at 116 C. The needles are removed, and the stoppers are pushed tightly into the vials with a sterile instrument. The vials are sealed with collodion and stored in the refrigerator until used. Tests for sterility and toxicity are carried out on selected samples of extract in accordance with requirements published in section 36 of the regulations of the National Institute of Health (revised Jan. 26, 1942). The liver extract may be given intramuscularly without further change. For intravenous use, the extract should be diluted and administered slowly after preliminary tests for sensitivity have been carried out.

Since 1941 more than 8,000 intravenous injections of this extract have been given without serious reactions to patients suffering from various types of hepatic insufficiency. It has been given occasionally in daily doses as large as 20 cc. diluted to 50 cc. with isotonic solution of sodium chloride or distilled water and administered intravenously.[10] In the present study, following preliminary tests for sensitivity, doses of this magnitude were administered two to three times weekly. At the onset of therapy and during the phase of ascites, icterus or esophageal hemorrhage the patients were given the full dosage (20 cc. diluted to 50 cc.) at least three times per week. Later, after these manifestations had been controlled, maintenance therapy was continued with the same dosage twice a week.

Allergic reactions from this intravenous liver extract were fortunately infrequent but of sufficient importance to make careful pretesting imperative. To test for sensitivity, from 0.1 to 0.2 cc. of the undiluted extract is given intramuscularly. If within thirty minutes no untoward reaction has occurred (characterized by flushing of the skin, headache, difficulty in breathing, cough or other signs of allergic reaction), slowly inject intravenously 0.5 cc. of the extract diluted with 20 cc. of sterile, pyrogen-free, isotonic solution of sodium chloride, distilled water or 5 per cent dextrose. If, during any injection, the patient complains of headache or shows decided flushing of the skin or signs of allergic phenomena the diluted extract should be given

7. Cohn, E. J.; Minot, G. R.; Alles, G. A., and Salter, W. T.: The Nature of the Material in Liver Effective in Pernicious Anemia, J. Biol. Chem. **77**: 325-358 (May) 1928.

8. Folin, O., and Bell, R. D.: Application of a New Reagent for the Separation of Ammonia: I. The Colorimetric Determination of Ammonia in Urine, J. Biol. Chem. **29**: 329-335, 1917.

9. The valuable technical assistance of Miss Dorothy Sloan in the successful preparation of this material is acknowledged. For the last two years of the study the extract made according to the Rockefeller formula was kindly supplied by Eli Lilly and Company, Lederle Laboratories, Inc., and Parke, Davis & Company.

10. Hoagland, C. L., and Shank, R. E.: Infectious Hepatitis: A Review of Two Hundred Cases, J. A. M. A. **130**: 615-621 (March 9) 1946.

even more slowly. Thereafter a series of graduated doses should be employed to initiate treatment, as illustrated in the following sample schedule:

1st day 1 cc. diluted to 25 cc.
2d day 3 cc. diluted to 30 cc.
3d day 5 cc. diluted to 50 cc.
4th day 10 cc. diluted to 50 cc.
5th day 15 cc. diluted to 50 cc.
6th day 20 cc. diluted to 50 cc.
Subsequently, 20 cc. diluted to 50 cc. 2-3 times per week.

The rate of dosage increment can be varied at will; for example, the time periods between doses may be extended to two or three days in those patients who exhibit minor reactions after any dose. In such cases the dose may also be decreased by one step in the schedule, or the same dosage may be repeated once or twice before proceeding to the next. Solutions should enter the vein at a rate not to exceed 5 cc. per minute. If pronounced flushing occurs, the solution should be injected more slowly or greater dilution should be used.

In only 2 patients, not included in the present study, was the administration of liver extract by the intravenous route considered inadvisable. Both patients were extremely sensitive to liver extract in any form and by any route of administration. Recent experience, however, has shown that, even in the exceptional case of sensitivity to crude liver extract, desensitization with minute doses of extract before administration of the full dose can be safely accomplished.

MATERIAL AND METHODS

The present report concerns the results of treatment of 30 patients with cirrhosis, using intravenous crude liver extract for six months or longer. Twenty-seven of these patients had Laennec's cirrhosis and 3, biliary cirrhosis. In all instances the diagnosis was well established by consideration of the historical details, physical examination, appropriate roentgenologic studies of the esophagus, abdomen and gastrointestinal tract and the use of a wide variety of tests of hepatic function and measurements of pertinent serum constituents. In 14 patients the diagnosis was confirmed by exploratory laparotomy or needle biopsy.

All patients were in the "decompensated" stage of cirrhosis, as indicated by the presence of icterus, edema, ascites or esophageal hemorrhage, singly or in combination. More than half of the patients had experienced some sign of hepatic decompensation one to six months before being given liver extract (table 1). Since the period immediately after decompensation has been demonstrated to be the most hazardous for the survival of patients with cirrhosis,[11] the major portion of the group presented a considerable challenge to the plan of therapy under investigation. No planned selection was exercised in the choice of patients beyond requiring that each case represent manifestly decompensated but not terminal cirrhosis.

The patients were hospitalized when necessary at the Hospital of the Rockefeller Institute and the New York Hospital. Many of the cases were referred from the latter institution for consultation and continuance of their care. When sufficient improvement had been accomplished by a short period of hospitalization, the patients were allowed to join the ambulatory group being treated with intravenous liver extract in the outpatient department of the Rockefeller Institute hospital. Abdominal paracenteses were performed in the hospital or, more frequently, in the outpatient department as the need arose. Diuretics were seldom used.

It is important to point out that a majority of the patients were more fortunate economically than the indigent alcoholic addicts with cirrhosis who are so often encountered in a general hospital service. Most of the patients were able to exercise good judgment in matters of personal hygiene and to apply reasonable intelligence to problems arising in the course of their protracted therapy. This fact made the group a particularly favorable one with which to work, since the importance of abstinence from alcohol and the maintenance of adequate nutrition were readily appreciated by most patients and observed without compromise.

No strict supervision of diet was undertaken beyond instructing the patients to select foods high in protein and rich in carbohydrate; no foods were prohibited if tolerated without distress.[12] Lipotropic substances, such as choline or methionine, were not prescribed, since it was believed that these food elements would be plentiful in an adequate dietary intake. Only in those patients exhibiting clinical signs of specific vitamin B deficiency at the onset of treatment were supplements of the vitamin B group prescribed, and these were continued only for the short period required for manifestations of deficiency to be overcome. In their search for medical care 18 patients had received dietary and vitamin therapy from other medical sources before being referred to the Rockefeller Institute hospital. Many had also received short trials of methionine and choline therapy. In all these patients previous management had proved to be ineffective and in no case did the patient consider that he had been benefited.

TABLE 1.—*Historical Data in Thirty Patients with Cirrhosis*

	Patients	
	No.	%
Fatigue	30	100
Recent icterus	28	93
Anorexia	27	90
Loss of weight	26	87
Nausea	25	83
Edema	24	80
Alcoholism	21	70
Swelling of abdomen	21	70
Inadequate diet	20	67
Diarrhea	17	57
Esophageal hemorrhage or melena	7	23
History of icterus in remote past	7	23
History of previous dietary and high vitamin treatment without benefit	18	60
Months decompensated before therapy		
1 to 6	16	53
7 to 12	4	13
More than 12	10	33
Number of paracenteses previous to liver extract treatment		
1 to 5	8	27
6	1	3.3
22	1	3.3
45	1	3.3

An excellent follow-up experience was obtained with this group. Observation periods varied from twenty-one to thirty-eight months, with an average for the group of approximately two years. With little exception the patients reported dependably two or three times a week to receive liver extract intravenously. During this treatment period there was opportunity for close observation of the clinical progress in each case and for the management of the numerous minor medical problems that arise in the course of a chronic illness.

11. Ratnoff, O. D., and Patek, A. J.: The Natural History of Laennec's Cirrhosis of the Liver, Medicine **21**: 207-268 (Sept.) 1942.

12. Hoagland, C. L.; Labby, D. H.; Kunkel, H. G., and Shank, R. E.: An Analysis of the Effect of Fat in the Diet on Recovery in Infectious Hepatitis, Am. J. Pub. Health **36**: 1287-1292 (Nov.) 1946.

CLINICAL FEATURES

The distribution of the patients by age and sex is given in table 2, and an analysis of the presenting histories is listed in table 1. Fatigue was a complaint common to all patients, and a large number had a history of recent icterus with the onset of hepatic decompensation. Gastrointestinal distress, nausea and anorexia with resulting loss of weight were prominent symptoms. Twenty-one of the 30 patients were chronic alcoholic addicts, and 20 of these had a history of inadequate diet. Of the 9 nonalcoholic patients, 5 had icterus in childhood or adolescence. Seven patients had experienced esophageal hemorrhage. No patients had a history of tropical disease or residence in a tropical country.

TABLE 2.—*Distribution by Age and Sex of Thirty Patients with Cirrhosis*

Age	Sex ♂	Sex ♀	Patients No.	Patients %
15 to 20	0	1	1	3.3
21 to 30	1	0	1	3.3
31 to 40	3	1	4	13.3
41 to 50	8	4	12	40.0
51 to 60	5	3	8	26.7
61 to 70	2	2	4	13.3
Total	19	11	30	

Physical signs indicative of hepatic disease with decompensation were observed in all the patients (table 3). Icterus was a common physical observation. The liver was enlarged in 22 patients, while in 8 it was not palpable and by percussion was reduced in size. Twenty-one patients had ascites, and there was accompanying hydrothorax in 4 of these. In 4 other patients icterus, ascites and esophageal hemorrhage coexisted, indicating an advanced degree of hepatic insufficiency. Esophageal varices were demonstrated roentgenologically in 11 patients. Over 90 per cent of patients displayed palmar erythema, or "liver palms," and spider angiomas. Over 50 per cent of the group gave evidence of hemorrhagic phenomena, such as easy bruising and bleeding gums, in association with depressed prothrombin values.

TABLE 3.—*Physical Signs Present in Thirty Patients with Cirrhosis Before Treatment with Intravenous Liver Extract*

	Patients No.	Patients %
Icterus	28	93
Palmar erythema	28	93
Spider angiomas	27	90
Collateral circulation over abdomen	25	83
Splenomegaly	25	83
Edema	22	73
Enlarged liver	22	73
Ascites	21	70
Icterus + ascites	19	63
Hemorrhoids	16	53
Hemorrhagic phenomena (bruising, bleeding gums)	16	53
Esophageal varices	11	37
Small liver	8	27
Clinical signs of B avitaminosis	8	27
Ascites + hydrothorax	4	13
Icterus + ascites + esophageal hemorrhage	4	13

LABORATORY FEATURES

The innumerable and diverse functions of the liver make it impossible to use any single test as a reliable index of the functional capacity of the liver. Moreover, hepatic failure is a relative matter in which individual functions are attacked selectively and with differing intensity. In approaching the evaluation of a new therapeutic agent it was thought advisable to use a number of different procedures to test the ability of the liver to perform its diverse metabolic functions. The laboratory aspect of the study, therefore, included a wide assortment of measurements and tests which were performed at intervals throughout the period of observation of each patient. These included measurements of the total plasma proteins with determination of the albumin-globulin ratio, the prothrombin time, alkaline phosphatase, serum bilirubin, total cholesterol and cholesterol esters with calculation of the free to total cholesterol ratio, and determination of the carotene and vitamin A levels of plasma. In addition, the cephalin-cholesterol flocculation reaction, the sulfobromophthalein sodium excretion test (5 mg. per kilogram of body weight in a forty-five minute interval) and the thymol turbidity reaction of the serum were determined (tables 4, 5 and 6). The technics employed for these measurements in this laboratory have been reported in detail in a previous communication.[10] Of this battery of tests, the measurement of plasma protein and the albumin-globulin ratio, serum bilirubin, ratio of free to total cholesterol and sulfobromophthalein excretion tests were considered to reflect most accurately the clinical state of the patient and the functional capacity of the liver. These tests, as well as those previously listed, were performed at regular weekly intervals during the acute phase of decompensation. Later they were spaced at greater intervals when less clinical change was apparent and as the course of the disease became better stabilized with continued therapy.

TABLE 4.—*Alterations in Plasma Protein Levels Observed During the Course of Intravenous Liver Extract Therapy of Thirty Patients with Cirrhosis*

	Percentage of Patients: Before Treatment	After 6 Mos. of Treatment	After 12 Mos. of Treatment	After 2 Yrs. (± 3 Mos.) of Treatment
Total protein 6.0 Gm./100 cc. or higher	43	73	79	86
Albumin-globulin ratio 1.5 or higher	22	22	33	43
Plasma albumin 3.5 Gm./100 cc. or higher	22	43	50	66
Plasma globulin 3.0 Gm./100 cc. or higher	56	50	50	39

TABLE 5.—*Alterations in Serum Bilirubin and Sulfobromophthalein Sodium Retention Observed During the Course of Intravenous Liver Extract Therapy of Thirty Patients with Cirrhosis*

	Percentage of Patients: Before Treatment	After 6 Mos. of Treatment	After 12 Mos. of Treatment	After 2 Yrs. (± 3 Mos.) of Treatment
Serum bilirubin (mg./100 cc.)				
0.2 to 0.6	10	22	26	30
0.7 to 1.0	20	24	36	30
1.1 to 2.0	30	26	16	17
2.1 to 3.0	10	16	10	13
Greater than 3.0	30	12	12	10
Sulfobromophthalein sodium retention (%)				
0 to 10	0	21	31	33
11 to 20	17	21	28	14
21 to 30	33	37	26	46
Over 30	50	21	15	7

RESULTS

The results of therapy are summarized in tables 4 to 8. Thirteen of the 30 patients were well enough to remain ambulatory throughout the period of observation and treatment. The remainder became ambulatory after a short period of hospital observation, so that by the time therapy was well under way the entire group could be managed in the outpatient department.

One of the first signs of improvement was a return of appetite, which in many instances became hearty after having been practically nonexistent before treatment. Coincident with this, a sense of well-being developed and fatigability diminished. The evidences of improved nitrogen storage were clinically apparent by the reversal of tissue wasting and a gain in body weight (table 7). Although changes of weight in patients with ascites and edema were difficult to evaluate, the appearance of flesh in previously wasted areas left little doubt that tissue regeneration and protein storage had occurred. Many of the patients previously employed continued to work throughout the period of therapy, but in 14 instances illness prevented patients from working. All the patients eventually were able to carry on their work effectively without the recurrence of the distressing fatigability that characterized their period of symptomatic illness (table 7).

TABLE 6.—*Alterations in the Levels of Various Constituents of the Blood and Tests of Liver Function Observed During the Course of Intravenous Liver Extract Therapy of Thirty Patients with Cirrhosis*

	No. of Patients Tested	Per Cent of Patients: Before Therapy	Per Cent of Patients: After 2 Yrs. (+3 Mos.) of Therapy
Cephalin cholesterol flocculation	29		
0 to 2+ *		28	86
3+		28	10
4+		44	4
Thymol turbidity reaction	27		
1 to 4 units *		8	11
5 to 10 units		33	56
11 to 15 units		33	22
Over 15 units		26	11
Alkaline phosphatase	26		
0.5 to 6 units *		27	57
7 to 10 units		35	19
Over 10 units		38	24
Free/total cholesterol ratio	25		
0.20 to 0.30 *		8	28
0.31 to 0.35		16	28
0.36 to 0.45		40	32
Over 0.45		36	12
Carotene	22		
Less than 0.080 mg./100 cc		50	18
0.080 to 0.250 mg./100 cc *		36	68
Over 0.250 mg./100 cc		14	14
Vitamin A	22		
Less than 30 micrograms/100 cc		73	32
30 to 60 micrograms/100 cc.*		27	63
Over 60 micrograms/100 cc		0	5

* Normal values.

One of the most satisfactory results was observed in the 21 patients with ascites. Most of these patients had submitted to repeated abdominal paracenteses before being seen at the Rockefeller hospital (table 1). In 7 cases the frequency of paracenteses was materially reduced, and in 12 cases, or 57 per cent of the group, there was complete disappearance of the ascites in two to twelve months after the start of therapy (table 8). One patient with ascites for one year before being seen at the Rockefeller hospital had undergone twenty-two paracenteses in that period of time (table 1). After five months of intravenous liver extract therapy the rate at which ascites reaccumulated became noticeably reduced and the intervals between abdominal tapping lengthened progressively. After eighteen months of biweekly liver extract therapy and fifty-three additional paracenteses, the ascites was completely controlled and has now remained so for an additional period of nine months. There was failure to influence the rate at which ascites reaccumulated in only 2 of the patients. As in the other 7 patients with persistent ascites, however, these 2 were better able to tolerate paracenteses, since with improved appetite and restored nutrition they experienced a return of vigor. In this group a phenomenon was frequently observed that suggested a direct effect of intravenous liver extract therapy on the factors which control fluid balance in hepatic disease:[13] occasional patients showed a periodic moderate diuresis several hours after the intravenous injection of liver extract. The diminution and final disappearance of edema and ascites, which proceeded over a period of several weeks, was always associated with a gradual increase in urine volume, which thereafter was sustained (chart 1).

TABLE 7.—*Progress of Thirty Patients with Cirrhosis Treated with Intravenous Liver Extract*

	Patients: No.	Patients: %
Months of liver extract therapy		
6 to 12	8	27.0
13 to 18	18	60.0
19 to 24	3	10.0
More than 24	1	3.3
Normal activity during total period of observation	13	43.0
Return to normal activity		
After 1 mo. of therapy	9	30.0
After 2 mos. of therapy	5	17.0
After 3 mos. of therapy	3	10.0
Improvement in appetite	30	100.0
Decrease in fatigability	30	100.0
Disappearance of wasting and increase in body weight	28	93.0

Changes in the constituents of the blood and in the results of tests of hepatic function observed during the period of treatment may be seen in tables 4 to 6. Only 43 per cent of patients in the group exhibited a total plasma protein of 6 Gm. per hundred cubic centimeters or higher before treatment. After six months of therapy 73 per cent were in this group, and by the end of two years this figure had risen to 86 per cent. It is apparent that, although the greatest rise in the total protein level occurred during the first six months of therapy, further improvement in several cases was detectable twelve to twenty-four months after the initiation of treatment. The early alterations in total protein were for the most part due to increases in the albumin fraction. Only 22 per cent of the group exhibited albumin levels of 3.5 Gm. per hundred cubic centimeters or higher at

TABLE 8.—*Effect of Intravenous Liver Extract Therapy on Ascites in Twenty-One Patients with Cirrhosis*

	Patients: No.	Patients: %
No effect	2	9.5
Decreased frequency of paracenteses	7	33.3
Disappearance of ascites	12	57.2

13. Labby, D. H., and Hoagland, C. L.: Alterations in Body Fluids During Acute Infectious Hepatitis, Proc. Soc. Exper. Biol. & Med. **63**: 110-114 (Oct.) 1946; Water Storage and the Movements of Body Fluids and Chlorides During Acute Liver Disease, J. Clin. Investigation, to be published. Ralli, E. P.; Robson, J. S.; Clarke, D., and Hoagland, C. L.: Factors Influencing Ascites in Patients with Cirrhosis of the Liver, ibid. **24**: 316-325 (May) 1945.

the start of therapy, but six months later this group had enlarged to 43 per cent, at the end of one year to 50 per cent and within two years to 66 per cent. Initially the globulin fractions were abnormally elevated in 56 per cent of the group, and these values showed little decrease during the first year of treatment. In many instances the globulin levels rose above the pretreatment level during the early course of therapy. Since this often occurred at the same time that the serum albumin was rising, there was little change in the albumin-globulin ratio until the latter half of the first year of therapy. During this period a slight fall in serum globulin was noted for the group, which fall became more evident during the second year of therapy. Changes in the albumin-globulin ratio were therefore delayed until this late period when, in the presence of sustained and improving levels of albumin, the globulin values began to fall (table 4). The increase in plasma protein concentrations and the ability to maintain efficient metabolic levels of albumin seemed to attest to the improved protein-synthesizing capacity of the liver subsequent to therapy.

The loss of ascites often reflected underlying improvement in the plasma proteins. In several patients, however, the rise in plasma proteins occurred after absorption of the ascites was well established (chart 2). This has been a matter of previous comment.[13]

Seventy per cent of the group showed visible icterus with an accompanying serum bilirubin determination greater than 1.0 mg. per hundred cubic centimeters before treatment, but after two years of treatment 60 per cent had no icterus and a serum bilirubin level of 1.0 mg. per hundred cubic centimeters or less (table 5). Great improvement was noted in the group of patients with initial serum bilirubin concentrations of 3.0 mg. per hundred cubic centimeters or higher. Although 30 per cent of the patients were in this group before therapy, only 12 per cent exhibited serum bilirubin levels of this magnitude after six months of treatment. There was equal improvement in the ability to excrete sulfobromophthalein sodium. Every patient in the group exhibited sulfobromophthalein retention of more than 10 per cent, and half showed more than 30 per cent retention before therapy. After approximately two years of treatment one third of the group exhibited from zero to 10 per cent retention (table 5). There were parallel improvements in plasma concentrations of alkaline phosphatase, carotene and vitamin A and in the free to total choles-

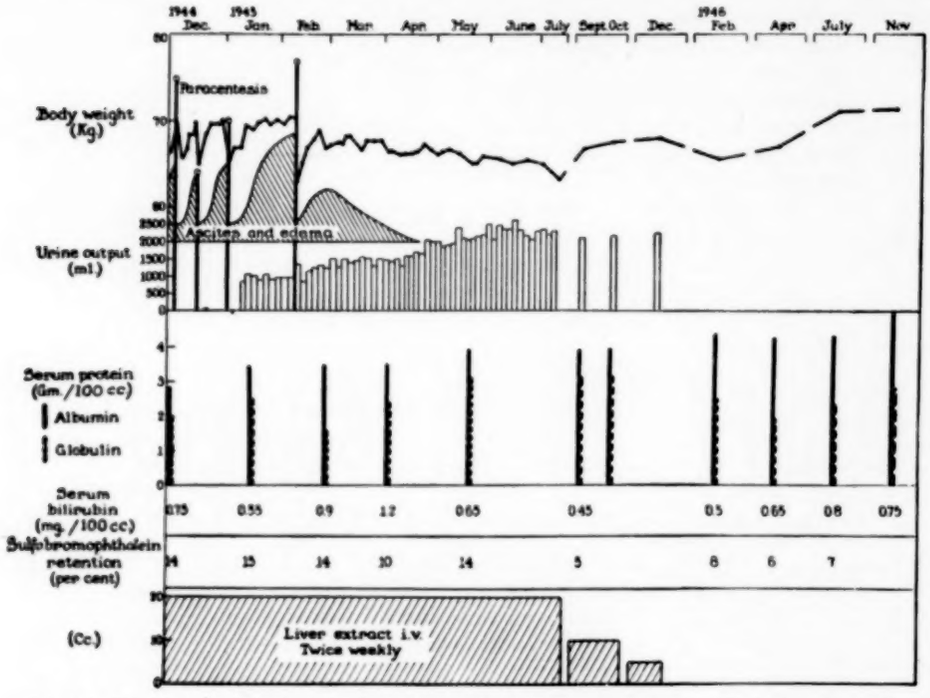

Chart 1 (B. S.) table 11.—A chronic alcoholic addict had one year of pronounced fatigue, anorexia, icterus and ascites unsuccessfully treated by the family physician with irregular dietary and vitamin therapy; he had forty-five paracenteses prior to treatment with intravenous liver extract. There was improvement in appetite and dietary intake with intravenous liver extract therapy; the disappearance of edema and ascites associated with a rise in urine volume occurred after four and a half months of treatment. Improvement in values for tests of liver function and serum proteins was observed. No relapse has taken place after more than one year of treatment-free observation period.

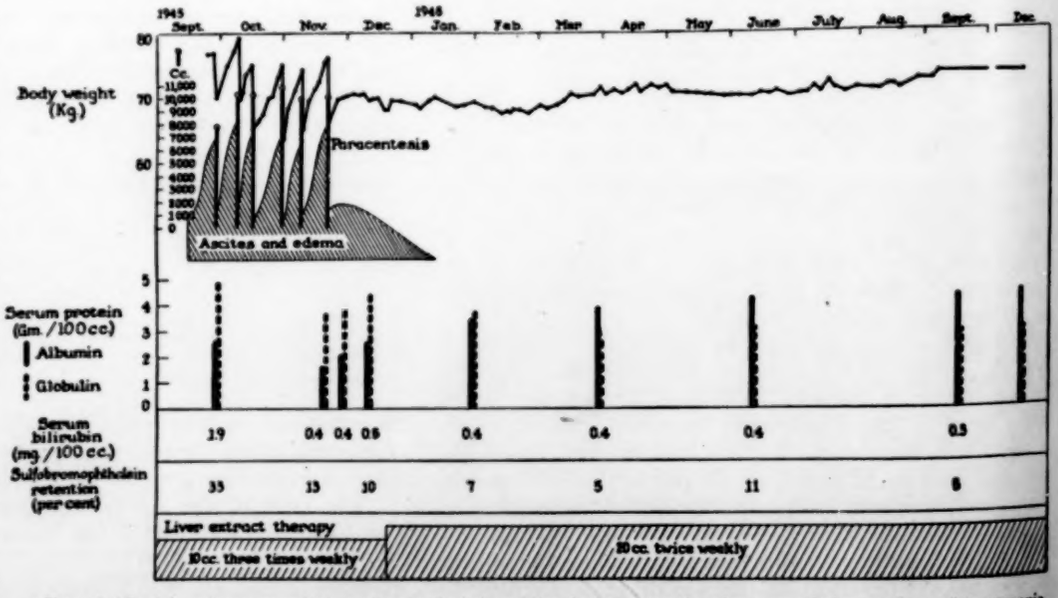

Chart 2 (G. A.).—A man aged 48, a chronic alcoholic addict, had two months of extreme fatigue and complete anorexia, slight icterus, edema, hydrothorax and ascites. The liver and spleen were enlarged; there was a reversal of the albumin-globulin ratio. Disappearance of edema, hydrothorax and ascites occurred before improvement in the plasma proteins and after four and a half months of dietary and intravenous liver extract therapy. Later there was restoration of the plasma protein levels; the patient is still receiving treatment.

terol ratios (table 6). Of all the measurements and tests performed, the cephalin-cholesterol flocculation reaction and the thymol turbidity reaction of the serum proved to be of the least value as accurate indexes of the clinical progress and course of the disease in these patients.

In this group of patients treated six months or more with intravenous liver extract, 7 deaths occurred (table 9). Two of the 3 cases of biliary cirrhosis are included in this group. In one (F. C.) the association of common duct obstruction due to stone was a material factor in hastening the patient's death. One fatality (E. M.) occurred in a 70 year old woman with ascites therapeutic agent for a chronic progressive disease such as cirrhosis, in which the anatomic, biochemical and metabolic defects are so well established by the time decompensation has occurred. Hence, the large group of patients who were treated less than six months is not the subject of analysis in this communication. Since this may effect some selection, it should be reported that in this inadequately treated group there have been 3 deaths shortly after the start of treatment (table 10). Two of these fatalities were due to massive esophageal hemorrhage in patients with numerous previous hemorrhages; in one (E. E.) treated four and a half months, ascites of one year's duration was controlled before

TABLE 9.—*Fatal Cases of Cirrhosis with at Least Six Months' Course of Intravenous Liver Extract Therapy*

Patient	Sex	Age	Clinical Data	Mos. of Treatment	Effect of Therapy	Cause of Death
F. C.	♂	33	Nonalcoholic; chronic icterus after inoculation with yellow fever vaccine 3 yrs. before; diarrhea, loss of weight and appetite, enlarged liver; A/G * = 2.78/2.85 = 1.0; sulfobromophthalein excretion 37%; bilirubin 3.8 mg./100 cc.; "biliary" cirrhosis	10	Improved appetite; weight gain; decreased fatigue	Common duct obstruction with stone; hepatic coma
V. M.	♀	37	Chronic alcoholism; icterus in childhood; 5 mos. of high icterus, diarrhea, anorexia and loss of weight; ascites 2 mos.; enlarged liver; A/G * = 2.81/3.42 = 0.8; sulfobromophthalein excretion 38%; bilirubin 10.7 mg./100 cc.	3, then lapse of 2 mos., then 14 mos.	Improved appetite; weight gain; decreased fatigue; loss of edema and ascites after 3 mos. of treatment, then withdrawal from treatment with recurrence of entire picture of esophageal hemorrhage; reversal again after resumption of treatment	Hemorrhage after tooth extraction; recurrent ascites; esophageal hemorrhage; hepatic coma
E. M.	♀	70	Two attacks of icterus in childhood and youth; nonalcoholic; esophageal hemorrhage followed by icterus, edema and ascites 5 mos. later; small liver, large spleen; A/G * = 2.65/2.84 = 0.7; sulfobromophthalein excretion 27%; bilirubin 0.8 mg./100 cc.	13	Improved appetite; weight gain; decreased fatigue; no effect on recurrence of ascites; improved tolerance of paracenteses, 16 performed	Intestinal obstruction due to old pelvic adhesion; postoperative death
H. McK.	♂	63	Fatigue, weakness, anorexia and loss of weight for 10 mos.; then icterus, abdominal pain, slight ascites and bleeding gums; enlarged liver and spleen; A/G * = 2.72/3.22 = 0.8; sulfobromophthalein excretion 37%; bilirubin 2.4 mg./100 cc.	8	Improved appetite; decreased fatigue	Hepatic failure with coma
M. S.	♀	52	Nonalcoholic; 2 yrs. of severe icterus, diarrhea, loss of weight, anorexia and weakness; 16 mos. of ascites, enlarged liver, no benefit from diet and vitamin therapy; frequent fever with elevation of icterus; 17 paracenteses before liver extract therapy	15	Decreased fatigue, improved appetite, loss of ascites; later increased icterus; recurrence of ascites	Hepatic failure with coma
G. T.	♀	42	Chronic alcoholism; icterus, fatigue and anorexia for 3 yrs.; ascites for 2 yrs.; enlarged liver, edema; A/G * = 3.41/3.17 = 1.1; sulfobromophthalein excretion 35%; bilirubin 1.9 mg./100 cc.	18 irregular therapy	Decreased fatigue, improved appetite, loss of ascites; weight gain	Active alcoholism during treatment; exsanguinating esophageal hemorrhage 4 mos. after withdrawal from therapy and continued alcoholism
D. B.	♂	66	Nonalcoholic; low protein diet by preference; 3 mos. of wasting, icterus and ascites; small liver, large spleen; esophageal varices; A/G * = 2.73/3.25 = 0.8; sulfobromophthalein excretion 21%	16	Improved appetite, decreased fatigue; tolerated 53 paracenteses at weekly intervals throughout treatment; resumed work and survived an esophageal hemorrhage after 3 mos. of therapy and a laparotomy 9 mos. later; no change in rate of accumulation of ascites, massive edema for the last year of life	Severe bronchitis with hepatic coma

* A/G, albumin-globulin ratio.

in whom there developed a low grade peritonitis which was followed by intestinal obstruction. At surgical intervention massive pelvic adhesions were found to be responsible for the obstruction and were believed to be a result of radiation therapy undertaken twenty years previously for sterility. V. M. died after an elective tooth extraction, which produced massive uncontrolled hemorrhage followed by recurrence of ascites and hepatic coma. G. T. was a moderately active alcoholic addict throughout her irregular treatment period. Despite this, her ascites had been brought under control. Against the advice of the investigators, she withdrew from therapy and continued to drink heavily. Four months later a massive esophageal hemorrhage resulted in exsanguination and death.

It is considered appropriate that at least a six months' trial of therapy be given before the evaluation of a new death occurred. The third death was due to coronary occlusion and cardiac failure in a patient who had sustained a coronary occlusion one year previously.

There have been a limited number of observations on the effects of withdrawal from intravenous liver extract therapy. Patient V. M. (table 9) established excellent control of edema and ascites after three months of regular therapy and then voluntarily withdrew. The entire picture of hepatic decompensation rapidly recurred and persisted for the treatment-free period of two months. Compensation was again established when treatment was resumed, and it persisted for fourteen months until shortly before death. Five patients have now completed a series of treatments of arbitrary length varying from ten to eighteen months, and they have been followed further for periods varying from four to fifteen months (table 11). Thus far all have

maintained excellent appetite and intake of food and have exhibited no relapses as determined by clinical findings and tests.

COMMENT

In analyzing the effects of therapy in cirrhosis, one is confronted with the appraisal of many factors that do not lend themselves easily to measurement. One such factor is the management of the many minor problems attending long illness. Since the patients whose cases are reported herein were seen in the outpatient department at least twice a week, many of these problems received prompt attention and care, so that periodic medical supervision of a rather elaborate type was available. How important this may have been in influencing the clinical course and final outcome of treatment is difficult to evaluate. In this regard the effect of abstinence from alcohol and the resumption of a normal intake of food in a person previously a heavy drinker is an important consideration. Moreover, since the majority of patients in the group were of moderate financial means, excellent selection could be exercised in planning individual diets, which were maintained at prescribed standards for foods rich in protein and carbohydrate. The importance of these several factors cannot be underestimated, since each represents in itself a partially effective method of treatment. Before unusual merit is claimed for the use of intravenous crude liver extract, it should be emphasized that this form of therapy has been used successfully only in conjunction with a full regimen of treatment.

A full diet, properly planned, should be the first consideration, and appetite therefore becomes a prime requisite. In anorexic patients, whose dietary intake has been compromised by alcoholism and chronic disease of the liver, the intravenous use of crude liver extract in large doses is considered to play its major role by encouraging and sustaining appetite. The vigorous use of vitamins, therefore, becomes less important in the patient with an appetite, who is able to eat adequately and derive essential food elements from natural sources.[14]

The clinical vitamin deficiencies should be treated with the appropriate essential substances, but this form of therapy need not be prolonged much beyond the usually brief period necessary to correct the manifestations of such deficiency.

TABLE 10.—*Fatal Cases of Cirrhosis After Less Than Six Months of Intravenous Liver Extract Treatment*

Patient	Sex	Age	Clinical Data	Duration of Treatment	Cause of Death
B. E.	♂	58	Chronic alcoholism; 3 esophageal hemorrhages; icterus, ascites; large liver and spleen	6 wks.	4th esophageal hemorrhage; pneumonia
J. E.	♂	63	2 yrs. gastrointestinal distress; coronary occlusion 1 yr. before; mild icterus, 3 mos. of ascites; large liver and spleen	6 wks.regular; no therapy 4 wks.; then 6 wks. irregular	Coronary occlusion with cardiac failure
E. E.	♀	49	Chronic alcoholism over 2½ yrs.; loss of weight and fatigue; 1 yr. of hydrothorax, edema, ascites and icterus; 6 esophageal hemorrhages; laparotomy; 11 paracenteses; large liver and spleen	4½ mos. regular therapy with increasing appetite, weight gain, decreased fatigability and loss of ascites	7th esophageal hemorrhage

TABLE 11.—*Patients with Cirrhosis Who Completed a Series of Intravenous Liver Extract Treatments and Are Now on Treatment-Free Observation Period*

Patient	Sex	Age	Clinical Data	Mos. of Therapy	Effect of Therapy	Mos. Since Therapy Terminated	Progress
B. S.†	♂	58	Chronic alcoholic; 1 yr. of ascites, icterus, fatigue and anorexia; large liver and spleen; 45 paracenteses; anemia; albumin 3.37 Gm. per 100 cc., globulin 2.03 Gm. per 100 cc.; sulfobromophthalein excretion 15%	13	Increased appetite; weight gain; loss of icterus and ascites; restoration of plasma proteins; albumin 4.99 Gm. per 100 cc., globulin 2.34 Gm. per 100 cc.; sulfobromophthalein excretion 7%	13	Continued weight gain, no recurrence of ascites or icterus; protein A/G * = 2.0
J. M.	♂	58	Chronic alcoholic; 3 mos. of icterus and ascites, anorexia and fatigue; enlarged liver; 3 paracenteses; albumin 2.34 Gm. per 100 cc., globulin 2.43 Gm. per 100 cc.; sulfobromophthalein excretion 42%	16	Increased appetite and loss of fatigability, icterus and ascites; albumin 3.50 Gm. per 100 cc., globulin 4.40 Gm. per 100 cc.; sulfobromophthalein excretion 30%	13	Occasional fatigue; no recurrence of icterus or ascites
P. J.	♂	59	Chronic alcoholic; enlarged liver for 9 yrs.; esophageal hemorrhage 4 mos. before; ascites, icterus, sulfobromophthalein excretion 22%	18	Increased appetite, loss of fatigability, icterus and ascites; decided improvement in tests of liver function	9	No recurrence of icterus or ascites; increased proteins; sulfobromophthalein excretion 5%; protein A/G * = 2.5
M. W.	♂	39	Fatigue and anorexia; chronic alcoholism; enlarged liver, 4 mos. of ascites; albumin 3.12 Gm. per 100 cc., globulin 6.32 Gm. per 100 cc.; sulfobromophthalein excretion 60%	10	Increased appetite; loss of fatigability and ascites; albumin 4.65 Gm. per 100 cc., globulin 2.64 Gm. per 100 cc.; sulfobromophthalein excretion 30%	15	No recurrence of ascites or fatigue; protein A/G * = 1.7
R. M.	♀	16	Nonalcoholic; cirrhosis after hepatitis; anorexia and fatigue; icterus; ascites for 7 mos.; enlarged liver and spleen; albumin 2.18 Gm. per 100 cc., globulin 3.78 Gm. per 100 cc.; sulfobromophthalein excretion 50%; active nonspecific ulcerative colitis	18	Restoration of appetite and strength; loss of fatigability, icterus and ascites; albumin 4.17 Gm. per 100 cc., globulin 2.33 Gm. per 100 cc.; sulfobromophthalein excretion 12.5%	4	No recurrence of icterus or ascites; no relapse in tests of liver function; continued moderate activity of ulcerative colitis

* A/G, albumin-globulin ratio † See chart 1.

14. Reprint and Circular Series no. 122, National Research Council, 1946, quoted in Present Status of Vitamin Requirements, Editorial, Am. J. Med. **1**: 447-448 (Oct.) 1946. Wilder, R. M.: Misinterpretation and Misuse of the Recommended Dietary Allowances, Science **101**: 285-288 (March 23) 1945.

There is some reason to regard cirrhosis of the liver as an intrinsic deficiency disease, in which faulty metabolism of certain essential components of the diet may give rise to syndromes which resemble deficiency diseases in their outward aspects but, unlike the currently recognized deficiency diseases, do not respond in any striking or specific manner to one or a combination of known vitamins.[15] However, this need not be an indication for the use of B vitamins in exorbitant doses, since the concept of faulty metabolism of vitamins of the B complex group in advanced hepatic insufficiency is based thus far largely on speculation and analogy and awaits convincing laboratory proof. Excellent evidence exists for vitamin A,[16] D [17] and K [18] deficiency, however, and the therapeutist need not hesitate for lack of rationale in supplying these substances when confronted by a patient with chronic hepatic disease who exhibits defective dark adaptation, steatorrhea, osteoporosis or low prothrombin values. That these deficiencies are essentially intrinsic will be realized when complete reversal does not result from appropriate substitution therapy.

So little is known about the complex chemical make-up of intravenous crude liver extract that it would be profitless to attempt to indicate what constituent factors might meet the requirements of a disease involving a multiplicity of intrinsic deficiencies, the majority of which are admittedly ill defined. It is conceivable that factors contained within crude liver extract are directed against intrinsic deficiencies as yet unrecognized. Too little methionine and choline are present in intravenous crude liver extract [19] in comparison to the amounts achieved by dietary intake to attribute to these agents alone the beneficial effects produced. It is of interest that small intramuscular doses of crude liver extract have been utilized in several recent investigations.[20] Other forms of nutritional therapy have proved of value in cirrhosis. A growing experience with injectable human serum albumin solutions has shown that this treatment adjuvant is of unique value in those patients with intractably low plasma protein levels, and especially in those who are unable to achieve positive nitrogen balance.[21]

Rest and freedom from undue physical strain are no less essential than diet, especially during critical periods of hepatic decompensation.[22] It is evident from a consideration of the elementary principles of physiology that rest or restriction of activity at once reduces the functional demands on the liver.

A review of experiences [23] in the treatment of cirrhosis with groups of patients comparable in size to our own has shown the two year survival rate to be approximately 45 per cent when dietary forms of therapy are widely supplemented with vitamins.[20b] By contrast, only 22 per cent [20b] to 25 per cent [24] of untreated control patients survived the first two years after decompensation. A comparable group of patients treated with intravenous liver extract has shown a 65 per cent survival rate at the end of a two year period.[24] The 23 surviving patients in our series represent a survival rate of 77 per cent at the end of the same interval.

In many instances such physical, economic and social rehabilitation was accomplished that it was difficult to compare the state of apparent health during the course of treatment with the previous serious clinical state before therapy. The universal experience of returning appetite in the group, with its desirable effect on the storage of protein and the general nutritional state, argues for the reversal of factors active in the production of hepatic decompensation. While it is not unlikely that liver extract may encourage the regeneration of hepatic tissue and assist in restoring to normal the aberrations of water balance, energy metabolism, vitamin storage and enzyme synthesis known to occur in patients with cirrhosis of the liver, such effects remain to be demonstrated by future work. The role of liver extract most easily ascertained clinically is the effect on appetite. That appetite becomes hearty in previously anorexic patients there is little doubt, and in many cases it develops to almost pathologic vigor. The resultant gain in nutrition and its reflection in bodily economy is undoubtedly of critical value in this form of therapy. It is also impressive that with the return of vigor the decompensated cirrhotic patient is better able to tolerate the vicissitudes of chronic illness.

SUMMARY

1. Thirty patients with decompensated cirrhosis of the liver were treated intravenously two or three times a week for six months or longer with large doses of crude liver extract. The period of observation varied from twenty-one to thirty-eight months, with an average of two years for the group.

2. No strict supervision of diet was undertaken, but withdrawal from alcoholic beverages was insisted on, and the patients were instructed to select foods high in protein and rich in carbohydrate; no foods were prohibited if they were tolerated without distress. Dietary supplements of vitamins and lipotropic agents such as methionine and choline were not used, beyond short term vitamin B therapy for those patients with clinical B avitaminosis.

3. Twenty-one patients were chronic alcoholic addicts, and at least 20 of these had a history of inadequate diet. Five other patients gave a history of icterus in youth. Seven patients had had esophageal hemorrhages, and 21 exhibited edema and ascites before treatment.

4. Throughout the period of observation the clinical progress of the patients was closely followed. Numerous tests of hepatic function and measurements of pertinent blood constituents were performed at frequent intervals.

15. Hoagland, C. L.: Therapy of Liver Diseases, Bull. New York Acad. Med. **21:** 537-556 (Oct.) 1945.

16. Ralli, E. P.; Papper, E.; Paley, K., and Baumann, E.: Vitamin A and Carotene Content of Human Liver in Normal and in Diseased Subjects: An Analysis of One Hundred and Sixteen Human Livers, Arch. Int. Med. **68:** 102-111 (July) 1941. Haig, C. and Patek, A. J.: Vitamin A Deficiency in Laennec's Cirrhosis, J. Clin. Investigation **21:** 309-317 (May) 1942. Adlersberg, D.; Sobotka, H., and Bogatin, B.: Effect of Liver Disease on Vitamin A Metabolism, Gastroenterology **4:** 164-174, (Feb.) 1945.

17. Lichtman, S. S.: Diseases of the Liver, Gall Bladder and Bile Ducts, Philadelphia, Lea & Febiger, 1942, chap. 14.

18. Lucia, S. P., and Aggeler, P. M.: The Influence of Liver Damage on the Plasma Prothrombin Concentration and the Response to Vitamin K, Am. J. M. Sc. **201:** 326-340 (March) 1941. Andrus, W. DeW., and Lord, J. W.: Clinical Investigations of Some Factors Causing Prothrombin Deficiencies, Arch. Surg. **41:** 596-606 (Sept.) 1940.

19. The following analysis of the liver extract prepared according to the Rockefeller formula has been submitted by the Lilly Research Laboratories: thiamine 0.00 mg., riboflavin 0.05 mg., methionine 0.84 mg., choline 3.32 mg., nicotinic acid 0.26 mg., and total nitrogen 21.02 mg., each per cubic centimeter; solids, 21.08 per cent and ash, 7.5 per cent of solids.

20. (*a*) Snell, A. M.: Recent Advances in the Treatment of Hepatic Disease, Minnesota Med. **23:** 551-556 (Aug.) 1940. (*b*) Patek, A. J.: Dietary Treatment of Laennec's Cirrhosis with Special Reference to Early Stages of the Disease, Bull. New York Acad. Med. **19:** 498-506 (July) 1943. (*c*) Barker, W. H.: The Modern Treatment of Cirrhosis of the Liver, M. Clin. North America **29:** 273-293 (March) 1945. Morrison, L. M.: The Response of Cirrhosis of the Liver to an Intensive Combined Therapy, Ann. Int. Med. **24:** 465-478 (March) 1946.

21. Kunkel, H. G.; Labby, D. H.; Shank, R. E.; Ahrens, E. H. Jr., and Hoagland, C. L.: The Use of Concentrated Human Serum Albumin Solutions in the Treatment of Cirrhosis of the Liver, to be published.

22. Kunkel, H. G.; Labby, D. H., and Hoagland, C. L.: Chronic Liver Disease Following Infectious Hepatitis: I. Abnormal Convalescence Following Initial Attack, Ann. Int. Med., to be published.

23. Labby, D. H.: Treatment of Hepatic Insufficiency, in Cornell Conferences on Therapy, New York, The Macmillan Company, 1947, vol. 2.

24. Ralli, E. P.: Personal communication to the author.

5. A return of appetite and an increase in caloric intake were found to be early signs of improvement and were eventually experienced by all patients. A gain in body weight and control of tissue wasting resulted.

6. In 12 of the 21 patients with ascites there was complete disappearance of ascites within two to twelve months after the start of therapy. In 7 patients the frequency of paracenteses was materially reduced, and in 2 there was failure to influence the rate at which ascites reaccumulated. It was believed that because of the return of appetite and the improvement in nutrition and vigor after therapy the patients were better able to tolerate paracenteses, whenever this procedure became necessary.

7. Improvement in the serum protein and bilirubin levels, as well as in sulfobromophthalein retention and other constituents of the blood and tests of liver function, was observed during the course of treatment.

8. Twenty-three patients, or 77 per cent of the group, have survived two years or more. Five patients treated from ten to eighteen months have been placed on treatment-free observation periods varying from four to fifteen months; none of these has shown detectable clinical or biochemical relapse.

9. On the basis of these observations it is believed that one of the effects of crude liver extract administered in large doses intravenously is to restore and sustain appetite in previously anorexic patients with cirrhosis. Used in conjunction with a full diet, a great nutritional advantage is gained which results in the control of wasting and the restoration of protein storage.

PROPYLTHIOURACIL IN THYROTOXICOSIS

Observations on Fifty-Four Patients

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Propylthiouracil has been recommended by Astwood and VanderLaan [1] as an effective substitute for thiouracil. Its antithyroid action in rats is approximately ten times that of thiouracil, and while it is more toxic than the latter on a weight basis, it is less toxic in quantities having a comparable therapeutic effect.

Clinical observations on the first 52 patients treated [1] point out that with few exceptions, 50 to 75 mg. propylthiouracil a day is an adequate initial dose, while 25 to 50 mg. a day is sufficient for maintenance. The antithyroid action is less intense than that of thiouracil; myxedema and thyroid enlargement have occurred only infrequently, and side reactions, not at all. From this study it appears that the new drug has approximately five times the activity of thiouracil, with few if any of the obstacles presented by the latter.

Fifty-four patients have been treated with propylthiouracil by me during a period of four months. Among 18 of these who had not received previous treatment, 13 (7 women and 6 men) had toxic nodular goiter and 5 (4 women and 1 man) had toxic diffuse goiter.

Thirty-seven patients still on varying maintenance doses of thiouracil were given the new agent instead. Of these, 22 (17 women and 5 men) had toxic nodular goiter and 14 (10 women and 4 men) had toxic diffuse goiter.

Five patients who had been unable to take thiouracil because of drug fever or urticaria were also included in the study. Three of these had toxic nodular goiter, 1 had toxic diffuse goiter and 1 had essential hypertension with normal thyroid function.

RESULTS IN PREVIOUSLY UNTREATED PATIENTS

Ten patients with toxic nodular goiter responded to the drug with an abatement of symptoms, gain in weight and lowering of the basal metabolic rate within four weeks on doses of 50 to 150 mg. a day.

Three of this group requiring only 50 mg. of the drug a day showed a drop in the basal metabolic rate from plus 15 to minus 12, plus 20 to plus 6 and plus 9 to minus 2 per cent. One patient died of acute myocardial infarction at the end of one month, but the other 2 have been maintained for three and two months, respectively, on the same dose.

Four of this group required 75 mg. of propylthiouracil per day. The basal metabolic rate of 1 changed from plus 27 to minus 11, 1 from plus 12 to minus 6, the third from plus 15 to minus 8 and the fourth from plus 41 to zero per cent. The first and second patients have required the same dose for maintenance, the symptoms of the third have been controlled with 50 mg. a day but the dosage of the fourth has been increased to 150 mg. a day.

In 2 patients control was achieved on 100 mg. of the drug daily, 1 showing a drop from plus 27 to plus 5, the other from plus 11 to minus 4 per cent. Both have required the same dose during three months and one month, respectively.

One patient with an initial basal metabolic rate of plus 12 per cent was given 150 mg. of the agent daily. In two weeks the improvement was decided, with the basal metabolic rate down to minus 5 per cent. This level was maintained during the following month on 75 mg. a day.

The symptoms of 3 patients have not been fully controlled in two to three months of treatment. Symptomatic improvement with gain in weight has occurred, but the expected drop in the basal metabolic rate has not followed:

One patient with an initial rate of plus 50 per cent was given 75 mg. of the drug daily for sixty-three days, with depression of the basal metabolic rate to plus 30, plus 31 and plus 29 per cent. The dosage was increased every two weeks to a present level of 200 mg. a day. No reduction in the basal metabolic rate followed after two weeks at this dosage level.

The second patient was cautiously started on a dosage of 25 mg. a day because drug fever had developed when she was taking thiouracil. The initial basal metabolic rate of plus 15 per cent has moved to plus 18 per cent during three months in which the dose was being slowly increased to 75 mg. propylthiouracil daily.

The third patient started with a basal metabolic rate of plus 21 per cent, which remained unchanged on 75 mg. of the drug a day for four weeks, 100 mg. for two weeks and 150 mg. for two more weeks.

It is perhaps significant that these 3 patients were between 60 and 70 years of age and they had had nodular thyroids for several years, factors which would make for slow response to treatment.

Of the 5 patients with toxic diffuse goiter, 1 showed improvement in four weeks, the basal metabolic rate moving from plus 11 to minus 4 per cent on 75 mg. of the agent daily, with maintenance on 50 mg. a day during the subsequent month.

From the Department of Medicine, Harper Hospital and Wayne University College of Medicine.

The propylthiouracil was supplied by Dr. Stanton M. Hardy, Lederle Laboratories, Inc., Pearl River, N. Y.

1. Astwood, E. B., and VanderLaan, W. P.: Thiouracil Derivatives of Greater Activity for the Treatment of Hyperthyroidism, J. Clin. Endocrinol. 5: 424 (Dec.) 1945.

In a second patient with basal metabolic rate of plus 12 per cent, the rate showed no change during sixty-five days on a dosage of 75 mg. daily, then dropped to minus 2 per cent after two weeks on 100 mg. of the drug a day.

In a third patient with recurrent hyperthyroidism drug fever developed after forty-one days' treatment.

A fourth patient with diabetes and recurrent hyperthyroidism showed an increase of the basal metabolic rate to plus 25 per cent after two weeks on a dosage of 75 mg. propylthiouracil a day, then dropped to plus 7 per cent after two weeks on 100 mg. a day. When the rate increased to plus 10 per cent in another two weeks the dose was increased to the present level of 150 mg. daily. No improvement in the diabetes has been observed.

The fifth patient, a Negro man aged 40 with a fulminating thyrotoxicosis, improved symptomatically during the first five weeks of treatment with 75 mg. a day, but the basal metabolic rate did not change from the initial plus 41 per cent. There was an increase in the rate to plus 53 per cent during the next two weeks on 100 mg. of the drug a day. A drop to plus 24 per cent and a gain in weight of 4 pounds (1.8 Kg.) occurred during the next two weeks on a dosage of 150 mg. a day.

In this small group the 2 patients with a mild form of the disease responded relatively promptly to a dosage of 75 to 100 mg. propylthiouracil daily. The 2 with a more severe disturbance are still not fully controlled on 150 mg. of the drug a day.

In summary, 10 patients with toxic nodular goiter and 2 with toxic diffuse goiter responded to treatment within four weeks on dosages of 50 to 150 mg. of the drug daily and have maintained their gains. The symptoms of 3 with toxic nodular and 2 with toxic diffuse goiter have not yet been fully controlled over a period up to three months on present doses between 75 and 200 mg. daily. These results are not to be classed as failures, since the patients have not been treated long enough.

RESULTS OF THE SUBSTITUTION OF PROPYLTHIOURACIL FOR THIOURACIL

A group of 22 patients with toxic nodular goiter (17 women, 5 men) and 14 with toxic diffuse goiter (10 women, 4 men) had been on daily maintenance doses of thiouracil ranging from 100 to 400 mg. for from one to eighteen months. To compare the effective maintenance doses and to determine the relative potencies of thiouracil and propylthiouracil, the latter was substituted in the treatment of these patients. Astwood's recommended average maintenance dose of between 25 and 50 mg. compared with the average maintenance dose of 100 to 300 mg. thiouracil yields an approximate equivalent of 25 mg. of the former for 100 mg. of the latter. Changes in medication were made on this basis, the initial dose being 25 mg. propylthiouracil a day, with increases made only when indicated.

Of the 22 patients with toxic nodular goiter, 16 who required 100 to 200 mg. thiouracil have remained as well controlled on an average of 35 mg. propylthiouracil for each 100 mg. thiouracil. Six patients formerly given 200 to 300 mg. thiouracil have not been as well controlled on an average of 33 mg. of the new agent per 100 mg. thiouracil.

Seven of the group in which toxic diffuse goiter was controlled by 100 to 200 mg. thiouracil did as well on an average of 29 mg. of the new drug for each 100 mg. of thiouracil. Symptoms of the remaining 7 patients who required from 100 to 400 mg. thiouracil were not adequately controlled with an average of 30 mg. propylthiouracil substituted for each 100 mg. thiouracil.

In 23 of the 36 patients control was adequate when an average of 32 mg. propylthiouracil was substituted for each 100 mg. thiouracil, while in the remainder inadequate control followed the use of 31.5 mg. of derivative drug. Accordingly, somewhat more than 32 mg. of the new drug appears to be the equivalent of 100 mg. thiouracil for suitable maintenance. For the initiation of treatment a dose of 128 to 192 mg. propylthiouracil should be equivalent to the average starting dose of 400 to 600 mg. thiouracil, giving the new drug a potency value three times that of thiouracil.

TOXICITY

A group of 5 patients unable to take thiouracil because of toxic reactions was started on propylthiouracil. Four had had typical attacks of drug fever, which cleared when administration of the drug was stopped and recurred when it was resumed. In the fifth there had developed urticaria, which behaved similarly in relation to the drug. Three patients had been taking 300 mg. thiouracil a day and 2 patients 600 mg. before the initial attack.

All these patients have now been taking propylthiouracil for four months without any sort of reaction. In 2 the hyperthyroidism is controlled by 50 mg. of the drug daily; in one, by 75 mg. daily, and in the fourth control has not yet been achieved with 75 mg. daily. The fifth patient, who has essential hypertension, is taking 150 mg. a day without difficulty.

It appears that patients who have been unable to take thiouracil are capable of handling propylthiouracil successfully. However, the new drug has toxic potentialities of its own, as demonstrated by the following instance of drug fever.

In a white woman aged 51, who had had a thyroidectomy in 1922, there developed recurrent hyperthyroidism with tachycardia, loss in weight, tremor, blood pressure of 160 systolic and 90 diastolic and a basal metabolic rate of plus 20 per cent. For many years she had suffered from "rose fever" and had been allergic to many substances. On April 23, 1946 she was started on 25 mg. propylthiouracil three times a day. Nausea developed two days later and recurred intermittently during the next four weeks. On May 21 the symptoms had improved only slightly and the basal metabolic rate was still plus 19 per cent, so the dosage was increased to 100 mg. of the drug daily. On May 29 the nausea was worse, and on June 3, forty-one days after the start of treatment, there developed headache, chills, sore throat and a fever of 103 F. The leukocyte count was 12,000, with the polymorphonuclears 70 per cent. Administration of the drug was stopped, and the attack subsided within three days. One week later treatment with the drug was resumed, and four hours after administration of the second 25 mg. tablet there was recurrence of the chills, aching, sore throat and fever. The attack subsided promptly, and no more of the drug was given.

Evidence of toxic effect on the blood or blood-forming tissues has not been noted in this series of patients. Blood counts were at first performed every week, then every two to four weeks. In no instance was there leukopenia, granulocytopenia or anemia.

COMMENT

The experience in treating 54 patients with propylthiouracil coincides in many respects with that of Astwood. Positive antithyroid action was observed,

and instances of myxedema or thyroid enlargement did not occur. However, the inability to bring the symptoms of nearly all the patients under control within a period comparable to that experienced with thiouracil may be attributed to too low dosage of the new drug. This should not detract from the antithyroid value of propylthiouracil for it must be recognized that because of its demonstrated potency in rats as ten times that of thiouracil, cautious use in human beings was clearly prescribed. Under the circumstances, a small initial dose, to be increased as indicated, seemed both safe and logical, even though it might postpone the desired control. This approach is exactly the opposite to that used with thiouracil, in which the direction was from a maximal toward a minimal dose, and may well account for the seeming difference in action.

Comparison of the control achieved by the two drugs in a group of patients formerly controlled with thiouracil and transferred to propylthiouracil indicates that it is necessary to use at least 32 mg. of the new drug to achieve the same action as that of 100 mg. of the old. Thus one may assign to propylthiouracil a potency value in man three times that of thiouracil, with the optimal initial dose between 120 and 190 mg. of the drug.

Of particular interest is the observation that 5 patients for whom thiouracil was toxic are able to take the new drug without difficulty. However, propylthiouracil has toxic potentialities of its own, for in 1 patient in the series there developed typical drug fever. While there were no other toxic reactions in this series it does not follow that these may not occur with the administration of larger doses of the drug.

Of the two antithyroid drugs, propylthiouracil, though its action is slower at present dosage levels, is much safer than thiouracil. While faster action may follow larger doses, toxic reactions may also occur, for propylthiouracil is still the more powerful of the two drugs.

SUMMARY

In a group of 18 previously untreated patients with thyrotoxicosis, 11 responded with abatement of symptoms, gain in weight and return of the basal metabolic rate to normal within four weeks on a dosage of propylthiouracil ranging from 50 to 150 mg. a day. One patient responded after 11 weeks' treatment, and in 1 drug fever developed after forty-one days. Five patients showed varying degrees of response just short of complete control because of too low dosage.

Thirty-six patients on maintenance doses of thiouracil were given propylthiouracil instead. The disease of 23 continued under satisfactory control while that of 13 was not controlled as well, again because of too low dosage. Apparently it takes at least 32 mg. of the new drug to match the effect of 100 mg. thiouracil, which would make the potency of the former three times that of the latter. An effective initial dosage comparable to 400 to 600 mg. thiouracil should accordingly be 120 to 190 mg. propylthiouracil daily.

Five patients unable to take thiouracil because of toxic reactions did not experience difficulty with the new drug.

In 1 patient there developed typical drug fever, but no other toxic reactions appeared in the rest of the group.

Propylthiouracil is a potent antithyroid agent fully as effective and much safer than thiouracil, although it is not incapable of producing toxic reaction.

TYPHUS FEVER IN THE UNITED STATES ARMY FOLLOWING IMMUNIZATION

Incidence, Severity of the Disease, Modification of the Clinical Course and Serologic Diagnosis

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Entry of the United States into World War II with exposure of our troops to epidemic (louse-borne) typhus fever in many parts of the world called for the use of adequate protective measures against this disease. One important aspect of this protection was the compulsory immunization with typhus vaccine of all soldiers going to or stationed in areas where epidemic typhus was present.

The purpose of this paper is to report on the excellent protection afforded the personnel of the United States Army by this prophylactic immunization, to record in a limited number of cases in which adequate clinical records have been collected the severity of the disease and the modification of the clinical course and to discuss methods of serologic diagnosis in those persons who contracted epidemic typhus subsequent to vaccination. The incidence of typhus fever in the entire United States Army during the war years, 1942 to 1946 inclusive, is also reported.

EPIDEMIC TYPHUS VACCINE

Subsequent to the demonstration by Ricketts [1] almost forty years ago of micro-organisms which now bear his name, the study of rickettsial diseases has received increasing attention. Since these diseases in man are usually serious and not infrequently fatal, it is not surprising that many investigations have been directed toward the production of prophylactic vaccines,[2] particularly for epidemic typhus fever.

It was early appreciated that persons recovering from these infections exhibited evidence of considerable immunity to subsequent reinfection, and efforts were therefore made, in the absence of adequate protection from killed vaccines, to produce a subclinical or modified infection with the causative organisms. The record of the use of living epidemic typhus vaccine presents a series of frank failures. Investigations based on the use of attenuated murine strains likewise led to results of doubtful value. Satisfactory immunity was developed only at the price and risk of the development in a patient of an active infection with murine typhus. Some patients died; this danger together with other dangers of the use of a living vaccine have been pointed out.[3]

With the growing realization of the dangers of the use of living vaccines, increasing efforts were directed toward the study of killed vaccines. The early work of da Rocha-Lima [4] and Weigl [5] on the use of killed suspensions of infected lice or infected feces of lice indicated that favorable results might be attained. These meth-

From the United States of America Typhus Commission, War Department, Washington 25, D. C.

1. Ricketts, J.: A Micro-Organism Which Apparently Has a Specific Relationship to Rocky Mountain Spotted Fever: A Preliminary Report, J. A. M. A. **52**: 379 (Jan. 30) 1909.
2. Murgatroyd, F.: A Review of Immunization Against Human Rickettsial Diseases, Tr. Roy. Soc. Trop. Med. & Hyg. **34**: 1 (June) 1940. Biraud, Y.: The Present Menace of Typhus Fever in Europe and the Means of Combating It, Bull. Health Organ., League of Nations **10**: 1, 1943.
3. Dyer, R. E.: The Menace of Typhus in Europe, J. A. M. A. **122**: 828 (July 17) 1943. Sadusk, J. F., Jr., and Kuhlenbeck, H.: Dangers Associated with the Use of Living "Attenuated" Typhus Vaccine, Am. J. Pub. Health **36**: 1027 (Sept.) 1946.
4. da Rocha-Lima, H.: Schutzimpfungsversuche gegen Fleckfieber, München. med. Wchnschr. **65**: 1454, 1918.
5. Weigl, R.: Untersuchungen und Experimente an Fleckfieberläusen: Die Technik der Rickettsia Forschung, Beitr. z. Klin. d. Infektionskr. **8**: 353, 1920.

ods, together with the use of other procedures such as suspensions of organisms obtained from the peritoneal cavity of the rat [6] or from rodent lungs,[7] were not, however, practical for large scale immunization.

Subsequent to the studies of Cox [8] in 1938, which demonstrated that rickettsias of the Rocky Mountain spotted fever and typhus groups could be grown in the yolk sac membranes of the developing chick embryo, Cox and Bell [9] in 1940 prepared an epidemic typhus vaccine based on the use of this tissue as a culture medium. This vaccine, which consisted of a killed suspension of Rickettsia prowazeki grown in the yolk sac membrane of the chick and purified by centrifugation, protected guinea pigs against challenge with the virus. Subsequent modifications, such as Craigie's [10] ether extraction and the inclusion of a so-called soluble antigen,[11] led to a vaccine that was satisfactory not only from the point of view of potency but also from the aspect of commercial production. Indeed, production in biologic houses in the United States during the World War II years reached as high as 75,000,000 cc. per year.

The epidemic typhus vaccine used by the United States Army consists of a 10 per cent yolk sac suspension of the Breinl strain of R. prowazeki extracted with ether. The vaccine contains both rickettsial bodies and soluble antigen.

Since early 1942 all United States Army personnel going to or stationed in areas in which epidemic typhus fever is present have received this vaccine. Until the fall of 1943 the initial vaccination consisted of three injections of typhus vaccine, 1.0 cc. each, administered subcutaneously at an interval of from seven to ten days, with stimulating or booster doses being given every six months in endemic areas. With increase in potency due to improvements in production, the initial immunization series was reduced in mid 1944 to two doses of vaccine and the stimulating dose was given at the beginning and in the middle of the typhus season (November 1 and February 1 in the northern hemisphere).

INCIDENCE AND MORTALITY OF TYPHUS FEVER

Official reports of communicable diseases which all Army organizations are required to make to the War Department through appropriate channels do not differentiate between the various members of the typhus group. Epidemic typhus, murine typhus and scrub typhus (tsutsugamushi fever) are included in these reports under the general term of typhus fever. It is possible, however, to obtain figures of a reasonable degree of accuracy for these specific diseases by grouping the cases under one of the three members of the typhus-like group according to geographic locality. For instance, it is evident that all cases of typhus fever contracted in and reported from the continental United States are murine typhus. Likewise, from epidemiologic data and detailed studies of case records, it is reasonable to suppose that cases of typhus fever reported from the Southwest Pacific and China-Burma-India areas are tsutsugamushi fever, although it is possible that a small number of these cases may actually be murine typhus. On a similar basis, cases reported from the European, Mediterranean and Africa-Middle East theaters fall into the epidemic typhus group.

TABLE 1.—*Incidence of Typhus Fever in the United States Army, 1942 to 1945, Expressed in Cases per Year and in Admission Rates per 1,000 per Year*

Area	Typhus Fever										Total 1942-1945					
	1942		1943		1944		1945		Total 1942-1945		Epidemic Typhus		Murine Typhus		Tsutsugamushi Fever	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
United States	40	0.02	128	0.03	162	0.04	84	0.03	414	0.03	..	....	414	0.03	...	....
European theater	0	0	1	0	0	0	27	0.01	28	0.01	28	0.01	...	....	...	....
Southwest Pacific	34	0.51	965	4.79	4,896	7.93	353	0.39	5,718	3.34	..	....	...	....	5,718	3.34
China-Burma-India	0	0	56	1.22	610	3.82	301	1.35	967	2.23	..	....	...	....	967	2.23
North America	0	0	0	0	0	0	0	0	0	0	..	....	...	....	...	....
Alaska	0	0	0	0	0	0	0	0	0	0	..	....	...	....	...	....
Latin America	3	0.03	0	0	4	0.05	6	0.08	13	0.03	..	....	13	0.03	...	....
Mediterranean theater	2	0.09	9	0.02	4	0.01	2	0.01	17	0.01	17	0.01	...	....	...	....
Africa-Middle East	2	0.35	15	0.28	2	0.10	0	0	19	0.13	19	0.13	...	....	...	....
Pacific Ocean area	16	0.11	76	0.26	65	0.16	19	0.06	176	0.15	..	....	176	0.15	...	....
Total U. S. Army, 1942-1945	97	0.03	1,220	0.18	5,243	0.70	792	0.11	7,352	0.39	64	0.003	603	0.025	6,685	0.27

From table 1 it can be seen that there were 64 cases of epidemic typhus, 603 of murine typhus and 6,685 of tsutsugamushi fever reported in the Army for the war years, 1942 to 1945 inclusive.

When the repeated exposure of American troops is considered it is remarkable that there were only 64 cases of epidemic typhus. However, this low incidence of epidemic typhus cannot be necessarily attributed to prophylactic immunization with typhus vaccine because other methods of protection (notably the use of insecticide powders such as MYL powder consisting of 0.2 per cent pyrethrins, 2 per cent N-isobutylundecylenamide, 2 per cent 2,4-dinitroanisole, and 0.25 per

In table 1 are recorded the official War Department figures [12] for typhus fever in the entire United States Army during the period Jan. 1, 1942 to Dec. 31, 1945. These figures are expressed in cases per year and in admission rates per 1,000 per year. On the right side of the table are given the total number of cases for the 1942 to 1945 period of epidemic typhus, murine typhus, and tsutsugamushi fever. It is believed that these data are reasonably accurate.

6. Zinsser, H., and Castaneda, M. R.: A Method of Obtaining Large Amounts of Rickettsia Prowazeki by X-Ray Radiation of Rats, Proc. Soc. Exper. Biol. & Med. **29**: 840 (April) 1932.

7. Castaneda, M. R.: Experimental Pneumonia Produced by Typhus Rickettsiae, Am. J. Path. **15**: 467 (July) 1939. Durand, P., and Giroud, P.: Essais de vaccination contre le typhus historique au moyen de Rickettsias tuées par le formol (souches pulmonaires), Arch Inst. Pasteur de Tunis **29**: 25 (March) 1940.

8. Cox, H. R.: Use of Yolk Sac of Developing Chick Embryo as Medium for Growing Rickettsiae of Rocky Mountain Spotted Fever and Typhus Groups, Pub. Health Rep. **53**: 2241 (Dec. 23) 1938.

9. Cox, H. R., and Bell, E. J.: Epidemic and Endemic Typhus: Protective Value for Guinea Pigs of Vaccines Prepared from Infected Tissues of the Developing Chick Embryo, Pub. Health Rep. **55**: 110 (Jan. 19) 1940.

10. Craigie, J.: Application and Control of Ethyl-Ether-Water Interface Effects to the Separation of Rickettsiae from Yolk Sac Suspensions, Canad. J. Research, Sect. E **23**: 104 (June) 1945.

11. Plotz, H.: Report on the Testing of Four Different Typhus Vaccines in Guinea Pigs, to the Director, Army Medical School, Army Medical Center, Washington, D. C., March 20, 1942. Topping, N. H., and Shear, M. J.: Studies of Antigens in Infected Yolk Sacs, in Topping, N. H., and others: Studies of Typhus Fever, National Institute of Health Bulletin 183, Federal Security Agency, United States Public Health Service, 1945, p. 13.

12. The Medical Statistics Division, Office of the Surgeon General, War Department, Washington, D. C., supplied the basic data from which table 1 was compiled.

cent of a mixture of isopropyl and diisopropyl cresols, in an inert diluent such as pyrophyllite and DDT powder [4,4'-dichlorodiphenyltrichloroethane] to prevent lousiness) were routinely employed. The question of whether or not vaccine will effectively reduce the incidence of epidemic typhus has not been conclusively demonstrated because of the difficulty of setting up an adequately controlled experiment in a human population on a large scale.

There are certain recent studies, however, which indicate that typhus vaccine prepared from the yolk sac membrane of the embryonated chicken egg will prevent or at least materially reduce the incidence of naturally acquired epidemic typhus. The results of the studies of Stuart-Harris [13] and Sachs [14] on typhus in the British Army suggest that reduction in incidence is effected by such immunization. Gilliam,[15] in a recently reported analysis of the effect of Cox type vaccine in preventing epidemic typhus fever among employees of the Cairo Fever Hospital at El Abbasa, Egypt, during the period from January to June, 1943, presents evidence which again suggests that adequate vaccination affords protection against a subsequent attack of louse-borne typhus.

On the other hand, there is universal agreement as to the effect of such immunization in reducing the

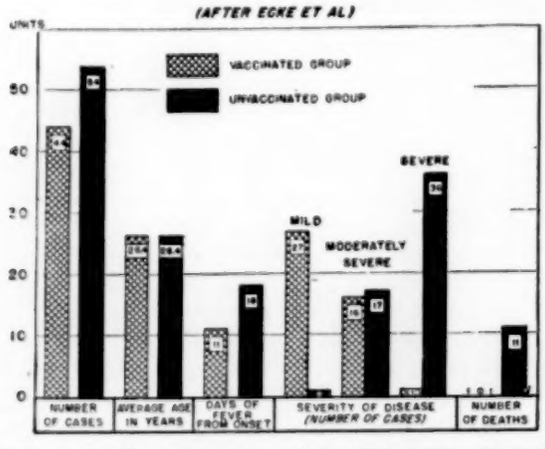

Chart 1.—Graphic representation of the clinical comparison of vaccinated and unvaccinated groups of typhus fever cases among employees of the Cairo Fever Hospital (after Ecke, Gilliam, Snyder, Yeomans, Zarafonetis and Murray [16d]).

case fatality rate.[16] In a carefully controlled investigation carried out among vaccinated and unvaccinated employees of the Cairo Fever Hospital, Ecke and his colleagues [16d] demonstrated a remarkable difference in not only the case fatality rate but also the clinical severity of the disease. They contrasted a group of 44 cases of epidemic typhus occurring subsequent to immunization with Cox type vaccine with a control group of 54 cases of typhus occurring without benefit of such prophylactic immunization; there were no deaths among the vaccinated group, but in the unvaccinated group there were 11 deaths. As to the severity of the disease, there were 27 cases classified as mild and 1 case classified as severe in the vaccinated group; in striking contrast to this, in the unvaccinated group there was only 1 case classified as mild and there were 36 cases classified as severe. There were 16 cases in the vaccinated group and 17 cases in the unvaccinated group which were classified as moderately severe. The average age of patients in both groups was 26.4 years. These facts are graphically illustrated in chart 1.

Both Stuart-Harris [13] and Sachs [14] reported a considerable reduction in mortality from epidemic typhus in the British Army following the institution of prophylactic immunization. Their reports show that the case fatality rate dropped to less than half the rate observed prior to immunization.

In the American Army there has not been a single death from epidemic typhus reported to the War Department during the period 1942 to 1945. This fact is perhaps the most striking observation made in this report and can be ascribed to prophylactic immunization with the Cox type of ether-extracted typhus vaccine. In my opinion the case fatality rate from epidemic typhus should be practically nil when adequate prophylactic immunization with this type of vaccine is practiced.

There is no evidence to indicate that epidemic typhus vaccine confers substantial immunity against infection with murine typhus in the human subject.

REPORT OF CASES

Adequate clinical records or abstracts of 5 cases were obtained and are briefly reported here. Clinical data pertaining to these cases are summarized in table 2, and serologic findings and typhus immunization records are recorded in table 3. It is hoped that a subsequent analysis of additional cases may be reported at a later date when clinical records have been collected from overseas and appropriately filed.

CASE 1.—A man aged 41, an officer and a member of the United States of America Typhus Commission, was engaged in typhus research work in Cairo, Egypt, with another officer (case 2) for almost a month before the onset of disease. They were both daily exposed to infection with typhus by examining patients, picking infected lice off rabbits and patients and handling and grinding infected louse feces for injection into experimental animals. In the preceding two years this officer had received a total of 22.0 cc. of vaccine in single 1.0 cc. doses. Five cubic centimeters of this vaccine was of an experimental lot and contained both epidemic and murine virus. The last dose of vaccine was received on March 1, 1944. The result of serologic examination prior to infection was as follows: on March 21 and April 4, 1944 the Weil-Felix reaction was negative but complement fixation was 1:8 with epidemic antigen and 1:4 with murine antigen.

On May 22, 1944 the patient experienced a mild headache and general malaise and felt feverish. Although the headache became severer and the temperature ranged between 100 and 101 F. during the next three days, he continued with his typhus research activities. On the fifth day, May 26, he took to his bed because of headache, fatigue and malaise. His backache was intense. The next day he reported to a medical dispensary; physical examination revealed a few pink papules on the left palm and wrist, a temperature of 99.2 F. and a pulse rate of 100. The rash had disappeared by the following morning, and except for a mild headache, anorexia and sense of fatigue the patient did well on rest in bed in his quarters, reporting daily to the dispensary. He was afebrile by May 28 and was permitted to remain out of bed on May 31.

Prior to the onset of typhus, the Weil-Felix reaction was negative with both Proteus OX 19 and OX 2 antigens and the complement fixation titer was 1:8 with epidemic antigen

13. Stuart-Harris, C. H.: Discussion on the Control of Rickettsial Infections, Proc. Roy. Soc. Med. **38**: 511 (July) 1945.

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TABLE 2.—*Clinical Summary of Five Cases of Epidemic Typhus Fever Incurred Subsequent to Immunization with Typhus Fever Vaccine*

Case	Age	Sex	Typhus Vaccine: Total, Cc.	Typhus Vaccine: Date of First Dose	Typhus Vaccine: Date of Last Dose	Date of Onset of Disease	Probable Manner of Infection	Incubation Period, Days	Where Treated	Severity of Illness	Days of Fever from Onset	Days in Bed	Rash	Headache	Confusion	Delirium	White Blood Cell Count
1	41	♂	22.0	3/21/42	3/ 1/44	5/22/44	Laboratory, pulmonary inhalation	Less than 17	Quarters	Mild	6	3	+	++	—	—	
2	35	♂	14.0	12/23/42	4/10/44	6/23/44	Laboratory, pulmonary inhalation	? 12	Hospital	Moderately severe	10	10	++	+++	±	—	6,300; 5,600
3	36	♂	6.0	2/17/44	10/ 1/45	11/22/45	Field, pulmonary inhalation	13	Quarters	Mild	9	5	—	+++	—	—	5,000; 6,600
4	32	♂	3.0	4/25/44	5/ 9/44	4/ 2/45	Field, pulmonary inhalation	10	Hospital	Moderately severe	11	11	+++	+++	—	—	7,000; 8,000
5	45	♂	9.5	8/ ?/44	3/22/45	4/ 2/45	Field, pulmonary inhalation	10	Quarters	Mild	12	5	—	+++	—	—	

TABLE 3.—*Serologic Observations and Immunization Record in Five Cases of Epidemic Typhus Fever Incurred Subsequent to Immunization with Typhus Fever Vaccine*

Case	Typhus Vaccine * Date	Typhus Vaccine * Amount, Cc.	Date of Serum Specimen	Day of Disease	Weil-Felix OX 19	Weil-Felix OX 2	Weil-Felix OX K	Serologic Data: Complement Fixation Epidemic	Serologic Data: Complement Fixation Murine	Rickettsial Agglutination Epidemic	Rickettsial Agglutination Murine
1	2/21/42 to 3/1/44	21.0 †									
		1.0	3/21/44	—61	—	—	..	1:8	1:4	.....	.....
			4/ 4/44	—47	—	—	..	1:8	1:4	.....	.....
			5/27/44	7	1:20	—	..	1:256	1:128	.....	.....
			5/31/44	9	1:80	—	..	1:1,024	1:256	.....	.....
			6/ 6/44	15	1:20	—	..	1:512	1:128	.....	.....
			6/10/44	19	1:20	—	..	1:512	1:256	.....	.....
			6/13/44	22	1:20	—	..	1:512	1:256	.....	.....
			6/17/44	26	—	—	..	1:512	1:128	.....	.....
			6/21/44	30	—	—	..	1:512	1:128	.....	.....
			6/24/44	33	—	—	..	1:512	1:128	.....	.....
			6/28/44	37	—	—	..	1:512	1:128	.....	.....
			7/ 4/44	43	—	—	..	1:256	1:128	.....	.....
			7/23/44	62	—	—	..	1:256	1:64	.....	.....
			8/ 3/44	73	—	—	..	1:256	1:32	.....	.....
			8/29/44	99	—	—	..	1:64	1:16	.....	.....
			9/16/44	117	—	—	..	1:64	1:16	.....	.....
			9/25/46	644	..	..	..	1:10	—	.....	.....
2	12/23/41 to 10/10/43	12.0									
	11/22/43	1.0									
			4/ 7/44	—78	—	—	—	1:8	—	.....	.....
	4/10/44	1.0									
			4/21/44	—64	—	—	—	1:8	—	.....	.....
			6/24/44	2	—	—	—	1:8	—	.....	.....
			6/25/44	3	—	—	—	1:8	—	.....	.....
			6/26/44	4	—	—	—	1:8	—	.....	.....
			6/30/44	8	1:20	—	..	1:128	1:8	.....	.....
			7/ 2/44	10	1:80	—	..	1:128	1:32	.....	.....
			7/ 4/44	12	1:160	1:40	..	1:256	1:32	.....	.....
			7/ 6/44	14	1:640	—	..	1:256	1:64	.....	.....
			7/11/44	19	1:1,280	—	..	1:512	1:64	.....	.....
			7/23/44	31	1:640	1:40	..	1:512	1:64	.....	.....
			8/29/44	68	1:160	—	..	1:128	1:32	.....	.....
			10/24/44	124	1:80	—	..	1:128	1:16	.....	.....
			2/ 7/46	594	—	—	..	1:20	—	—	—
3	2/17/44 to 7/28/44	4.0									
	5/ 9/45	1.0									
			6/ 6/45	—169	—	—	—	1:10	—	1:40	—
			8/ 4/45	—110	—	—	—	1:10	—	1:40	—
	10/ 1/45	1.0									
			11/28/45	7	1:40	—	..	1:40	—	1:40	—
			12/ 5/45	14	1:80	—	..	1:640	1:160	1:640	1:80
			12/12/45	21	1:80	—	..	1:1,280	1:160	1:320	1:80
			12/26/45	35	1:80	1:80	..	1:640	1:160	1:320	1:80
			1/16/46	56	1:40	—	..	1:320	1:80	1:160	1:40
			2/ 6/46	77	—	—	..	1:320	1:40	1:160	—
			2/27/46	98	—	—	..	1:320	1:40	1:160	—
			3/26/46	125	—	—	..	1:160	1:20	1:80	—
4	4/25/44	1.0									
	5/ 2/44	1.0									
	5/ 9/44	1.0									
			4/ 9/45	8	1:40	—	..	.....	.....	.....	.....
			4/12/45	11	1:40	1:40	..	.....	.....	.....	.....
			4/18/45	17	1:640	1:640	..	.....	.....	.....	.....
			4/24/45	23	....	....	..	1:1,024	1:512	.....	.....
			4/25/45	24	1:640	....	..	.....	.....	.....	.....
			3/ 4/46	337	—	—	—	1:20	1:10	—	—
5	8/ ?/42 to 12/28/44	8.5									
	3/22/45	1.0									
			4/21/45	20	..	..	..	1:128	1:64	.....	.....
			7/ 3/45	92	1:40	—	..	1:40	1:20	1:160	—
			3/ 3/46	336	1:40	..	..	1:20	1:10	—	—

* Cox type ether-extracted epidemic typhus vaccine.
† Five cubic centimeters of this vaccine was of an experimental bivalent type containing epidemic and murine rickettsias.

and 1:4 with murine antigen. By the end of the first week of disease the Proteus OX 19 titer rose to 1:20, and in the second week it rose to 1:80. It reverted to negative in the fourth week. The complement fixation titer rose rapidly to attain a titer of 1:1,024 in the second week. Almost two years later the complement fixation (with epidemic antigen) was still positive with a titer of 1:10.

CASE 2.—A man aged 35, an officer and a member of the United States of America Typhus Commission, was engaged in typhus research work in Cairo, Egypt, with another officer (case 1) for over a month prior to the onset of illness. Although he was exposed to the disease daily, he recalled that he was dangerously exposed on June 11, 1944 when he assisted with the handling and grinding of infected louse feces in large amounts. In the period from Dec. 23, 1941 to Oct. 10, 1943 he received a total of 12.0 cc. of typhus vaccine in 1.0 cc. increments. On Nov. 22, 1943 he received 1.0 cc. epidemic typhus vaccine and on April 10, 1944 an additional and final dose of 1.0 cc. of the vaccine. Although the Weil-Felix reaction was negative with both Proteus OX 19 and Proteus OX 2 antigen, the complement fixation titer with epidemic antigen was 1:8 three days before and eleven days after the patient received the last dose of vaccine.

On the morning of June 23, 1944 the patient awakened with a mild but troublesome frontal headache which persisted throughout most of the day. The next day the headache recurred together with malaise and easy fatigability. His temperature was 101 F. These symptoms persisted with such an increase in both severity and extent of the headache that he was admitted to the hospital late in the afternoon of the next day, June 25. The following day his temperature was 100.4 F., his pulse rate was 80, his respiratory rate was 20 and his blood pressure was 106 systolic and 60 diastolic. Although he did not appear acutely ill, he complained of headache, sensations of chilliness and nausea. Physical examination revealed only a well defined injection of the scleral conjunctivas. Later in the afternoon his temperature rose to 102 F. and a diffuse macular eruption appeared over the anterior part of the chest, arms, shoulders and flanks with an erythematous blush that disappeared on pressure. He continued that afternoon and night to experience slight chills. By the next morning the rash had definitely faded but his headache, which was now generalized, became exceptionally severe. Chills continued, and he appeared decidedly ill. There were intermittent, drenching sweats, and he complained of severe backache and general malaise. The temperature rose to 103.2 F. that night, but the pulse rate was only 90. The respiratory rate was normal. Although the temperature fell to 99.2 F. by the following morning (June 28) and remained below 100.6 F. throughout the course of the day, severe headache, malaise, sweating and occasional chills persisted. He vomited several times, and on one occasion there was a transient amnesia. During the next two days these symptoms still persisted but the temperature remained relatively low and the rash became increasingly less evident, disappearing completely by July 1. On June 29 the physician reported that the patient appeared to be disoriented for a brief period, but this was not confirmed and was later denied by the patient. From June 30 on, there was rapid and progressive improvement (chart 1) with fall in temperature by rapid lysis, subsidence of headache, malaise, nausea and vomiting and rapid increase in serologic titers for typhus fever. On June 30 there was a left earache, but this disappeared within forty-eight hours without specific therapy. The temperature was normal by July 3. On July 5 the patient was permitted to be out of bed, and he was discharged on the following day as an ambulatory patient.

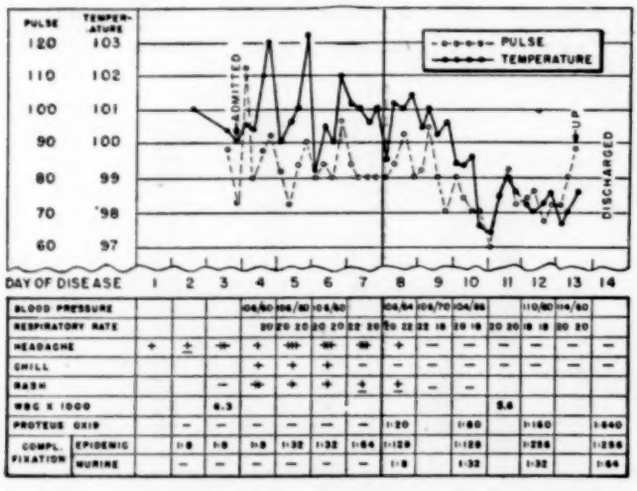

Chart 2.—Clinical course and early serologic data in case 2, an example of a moderately severe case of epidemic typhus in a vaccinated person.

During the course of the patient's stay in the hospital there was no pronounced hypotension. On June 26, the day of admission, the red blood cell count was 4,600,000, the hemoglobin was 95 per cent and the leukocyte count was said to be 6,300 with 45 per cent stab cells, 33 per cent polymorphonuclear neutrophils, 20 per cent lymphocytes and 2 per cent monocytes. On July 3 examination of the blood was as follows: red cells 4,650,000, hemoglobin 95 per cent, leukocytes 5,000 with 15 per cent stab cells, 53 per cent polymorphonuclear neutrophils, 18 per cent lymphocytes and 14 per cent monocytes. Urinalysis on June 26 was negative. The color was clear amber, and the specific gravity was 1.010. Tests for albumin and sugar were negative.

Serologic tests were performed daily during the early acute phase of the disease. The Weil-Felix reaction with Proteus OX 19 antigen remained negative until the eighth day, when it became positive in a titer of 1:20. It then rose rapidly, reaching a top figure of 1:1,280 on the nineteenth day. It was still positive at 1:80 on the one hundred and twenty-fourth day, but when next checked almost two years after the onset of the disease, it was found to be negative. Complement-fixing antibodies began to rise by the end of the first week of disease, reaching a peak with epidemic antigen of 1:512 by the nineteenth day. The titer began to fall after the thirty-first day, and when last checked almost two years later the titer was still positive at 1:20. Specific rickettsial agglutinations were negative at that time.

CASE 3.—A man aged 36, an officer and a member of the United States of America Typhus Commission, was engaged in typhus control work in Hokkaido, Japan. On Nov. 10, 1945 he was heavily exposed in the room of a Japanese hospital to dust containing suspended louse feces from the clothing of a patient with an active typhus infection. From Feb. 17, 1944 to July 28, 1944 he had received a total of 4.0 cc. of typhus vaccine in 1.0 cc. doses. On May 9, 1945 and Oct. 1, 1945 he received additional 1.0 cc. doses of the vaccine. On June 6 and Aug. 4, 1945, serologic examination was as follows: the Weil-Felix reaction was negative; complement fixation was 1:10 with epidemic antigen and negative with murine antigen, and rickettsial agglutination was 1:40 with epidemic antigen and negative with murine antigen.

On Nov. 22, 1946 the patient experienced sensations of chilliness and generalized malaise. The next day headache, apathy, anorexia and irritability appeared. These persisted during the next two days with chilliness, and although the patient felt feverish he did not take his temperature. On the fifth day the temperature was 101.8 F., the pulse rate was 88 and the respiratory rate was 20. Headache became severer and was predominantly bitemporal. A persistent dry hacking cough set in, and the patient vomited once. The next day, the sixth day of disease, he refused hospital admission but finally took to bed in his quarters. The headache became excruciating in severity, the temperature rose to 102.2 F. and nausea and cough persisted. Although the temperature rose to 103.8 F. the night of the seventh day and he became drowsy, there was suddenly a feeling of relative well-being on the following day, with sudden resolution of fever by crisis and with profuse sweats. He was afebrile by the ninth day, out of bed on the tenth day and back to work on the thirteenth day, although he tired easily on exertion. The blood pressure remained normal throughout, and there was no rash. The lungs were clear.

The leukocyte count on the seventh day was 5,000. On the thirteenth day, a complete examination of the blood at an outpatient clinic showed 4,620,000 red cells, 90 per cent hemoglobin and 6,600 leukocytes, with a differential count of 64 per cent polymorphonuclear leukocytes and 36 per cent lymphocytes. On the twelfth day urinalysis was negative except for a faint trace of albumin, with a few leukocytes in the microscopic examination. These findings had disappeared by the following day. On the twenty-first day the electrocardiographic tracing was normal in all four leads. The heart rate was 84, the PR interval was 0.16 second, there was sinus rhythm, the QRS complexes were 0.06 second, the T waves were upright in all leads and there were no ST changes.

The serologic changes are given in detail in table 3. Briefly, the Weil-Felix reaction became positive on the seventh day with a titer of 1:40 and reached as high as 1:80 by the fourteenth day. The complement fixation began to rise with epidemic antigen by the end of the first week and was still strongly positive by the fourth month. Rickettsial agglutination did not rise until the second week but reached its peak at that time with a titer of 1:640 with epidemic antigen. It was still positive by the fourth month.

CASE 4.—A man aged 32, an officer, was engaged in typhus control work in Fischbach, Germany. On March 23, 1945, he and another officer (case 5) were heavily exposed to dust containing suspended louse feces in the room of a barracks (recently taken from the Germans) in which louse-infested Russian typhus patients were hospitalized. A Russian male nurse had just vigorously shaken out a shirt belonging to one of the patients. The officer (case 4) had received only three 1.0 cc. doses of typhus vaccine, given one week apart in April and May, 1944. The first dose was received April 25, 1944 and the last dose May 9, 1944, a full year before exposure to infection.

The onset of illness was April 2, 1945 with headache, chilliness, decided fatigue and mental depression. These symptoms persisted, and the following day the patient had a shaking chill. The next day, the third day of disease, he was admitted to the hospital for an elective surgical operation of minor nature. Although his temperature at this time was 100 F., physical examination revealed no abnormalities. He was closely observed, and on the fourth and fifth days, although his temperature had risen to 103 F. and he had several shaking chills and an increase in headache, backache and generalized malaise, no observations of a diagnostic nature other than cervical adenopathy and pain in the right upper quadrant were evident. In the next six days his temperature ranged from 101 to 104.5 F. and he complained bitterly of an excruciating headache. He was nauseated and vomited. Malaria, meningitis, hepatitis and infectious mononucleosis were considered in the differential diagnosis along with typhus fever, although definite evidence could not be obtained for any of these diseases. Finally, the diagnosis was clarified on the eighth day by the appearance of a crop of pink macules over the abdomen, chest and back. This rash spread to the arms and legs by the following day but began quickly to fade shortly thereafter (on the tenth day) with an abrupt fall in temperature; it disappeared on the twelfth day. There were no hemorrhagic residues. The fever, which fell by crisis, reached normal by the afternoon of the eleventh day. On the fourteenth day the patient was permitted to get out of bed, and convalescence was uneventful except for weakness and depression.

Many diagnostic laboratory procedures, such as blood culture, lumbar puncture, blood smears and various agglutination tests, were performed on this patient in the early acute phase of the disease but were all essentially negative. Roentgenologic examination of the chest on the ninth day revealed clear lung fields. The leukocyte count on the eleventh day was 7,000 with 70 per cent polymorphonuclear neutrophils, 20 per cent small lymphocytes, 8 per cent large lymphocytes and 2 per cent basophils; on the fifteenth day the leukocyte count was 8,000 with an essentially normal differential count. The Proteus OX 19 agglutination titer rose from 1:40 on the eighth day to 1:640 on the seventeenth day. The complement fixation titer for epidemic antigen on the twenty-third day (performed at the First Medical General Laboratory in Paris) was 1:1,024. Almost a year later this reaction was still positive in a dilution of 1:20, while the Weil-Felix reaction was negative.

CASE 5.—A man aged 45 was the chief medical officer of a Civil Affairs unit in Germany and frequently came into contact with typhus patients during the course of his work. On March 23, 1945 he was heavily exposed to dust containing suspended louse feces along with and under the same conditions as the officer in case 4. He had received a total of 8.5 cc. of typhus vaccine from August 1942 to Dec. 28, 1944. All these doses were 1.0 cc. except for a single dose of 0.5 cc. On March 22, 1945 he received his final stimulating dose of 1.0 cc. of the vaccine.

The illness of the patient began on April 2, 1945 with fever and headache. These symptoms became progressively severer together with anorexia during the ensuing five days. Finally, when the headache became excruciating in severity and a nonproductive cough set in, he reported on the eighth day to a medical dispensary. His temperature was 103 F. He was not hospitalized but was put to bed in his quarters. The temperature progressively fell during the next several days, becoming normal by the thirteenth day, and the headache abated. He returned to work on the fourteenth day. There were no chills. Cutaneous eruption was absent.

Appropriate laboratory procedures were not performed during the acute stage of the disease to confirm the diagnosis. A specimen of blood collected on the twentieth day and examined by the First Medical General Laboratory revealed a complement fixation with epidemic antigen in a dilution of 1:128 and with murine antigen in a dilution of 1:64. Unfortunately, no record exists of further specimens being examined for serologic data until July 2, 1945. This sample, examined at the Army Medical School in Washington, D. C., indicated that the complement fixation titer had dropped but was still positive in a dilution of 1:40. Complement-fixing antibodies were still present in a titer of 1:20 almost a year after the onset of illness.

CLINICAL FEATURES

The clinical features of the 5 cases reported herein are summarized in table 2. All the patients were male officers; 3 were in their thirties and 2 were in the fifth decade of life. Except in case 4 all patients had received adequate amounts of vaccine and stimulating doses had been administered within eleven to seventy-three days prior to the onset of disease. The officer in case 4 had only an initial series of three 1.0 cc. doses of vaccine, the last dose having been administered almost a full year before the onset of typhus. In this connection it is interesting to note that he not only suffered the severest attack of typhus of any of the group, with asthenia lasting well into late convalescence, but also presented a widespread eruption over the entire trunk, legs and arms. The incubation period ranged from ten to thirteen days in the 3 cases in which it could be accurately determined, was questionable at twelve days in 1 case and was less than seventeen days in another case. Only 2 of the 5 officers were ill enough to be admitted to the hospital; the others remained in bed in their quarters. Of particular interest is the short period for which they were confined to bed. In 3 cases this was five days or less; in the remaining 2 instances it was ten and eleven days, respectively. The duration of fever (less than 99 F.) from the onset of disease was likewise reduced in comparison with that in the average unvaccinated patient, the values being six, ten, nine, eleven and twelve days for cases 1, 2, 3, 4 and 5, respectively. Rash was absent in 2 cases and even when present (except in case 4) was not striking. Symptoms referable to the central nervous system, except for headache, were conspicuous by their absence, although in case 2 the patient was said to have shown some indication of disorientation for a short period. This, however, was never substantiated. Head-

ache was severe in every instance and was by far the most striking symptom of the disease. Leukocyte counts were performed in 3 cases during the course of the disease, early and late. In no instance was there a leukocytosis, thus giving the picture of an uncomplicated rickettsial disease. In classical typhus, early counts not infrequently show a leukopenia while later in the disease with the appearance of bacterial complications the count rises rapidly with an increase in the young neutrophilic fraction of the differential count. There was no evidence in any of the cases of undue prostration or of cardiovascular or renal involvement.

The picture reported here is in decided contrast to that in the unvaccinated patient with classic typhus. The temperature in classic typhus usually remains elevated between 104 and 106 F. until the end of the second week; the patient becomes delirious, comatose and finally stuporous, and signs of cardiovascular and renal involvement may appear. The rash is extensive and hemorrhagic, and convalescence is prolonged.

Of particular interest is the method of infection. In every instance there was considerable evidence to indicate that infection was not sustained by the "bite" of a louse but rather by the inhalation or conjunctival absorption of suspended infected louse feces. It has been well known for many years that physicians and nurses attending patients with epidemic typhus fever contract the disease in spite of active and vigorous measures to prevent infestation with lice.

SEVERITY AND MORTALITY OF POSTVACCINATION TYPHUS

The clinical features of the 5 cases of postvaccination epidemic typhus described here are in general accord with those already described for laboratory [17] and field [18] infections. These studies show that the clinical course of epidemic typhus is greatly modified when infection occurs subsequent to immunization with vaccine. The temperature is much lower and the fever is of shorter duration than in nonvaccinated patients, the period of hospitalization (if necessary) is appreciably reduced, the extent and duration of rash is diminished, circulatory and nervous symptoms are lessened and the incidence of complications is brought down to an exceedingly low figure. The most striking result of immunization, however, is the fact that there has not been a single death reported in the series of cases of adequately vaccinated patients studied in these investigations.

In many instances the diagnosis of typhus is extraordinarily difficult in vaccinated persons because of the modification of the clinical picture and serologic procedures must be employed for confirmation. The only important symptom which regularly remains is the severe headache.

It is difficult at this time to accurately state the time limits within which one may expect satisfactory protection from typhus after vaccination. It would appear, however, from such data as are available that protection is adequate up to a year following vaccination and that there is little indication that vaccine exerts a favorable action unless it is given at least one and a half or two weeks prior to exposure. Ecke and his colleagues [16d] observed that there was no apparent diminution in benefit up to three hundred and twenty-five days subsequent to the reception of a dose of typhus vaccine, and that while the course of illness was somewhat shorter and milder in a group of patients who were vaccinated within one and a half to two weeks prior to the onset of the disease, fatality might occur. A 35 year old man who was vaccinated three days before the onset of disease died with epidemic typhus. In the present report, 1 patient (case 4) had not received vaccine for eleven months prior to the onset of disease. His disease ran a moderately severe course, and he had an extensive rash. In the light of this experience, the time limit for maximum effectiveness of vaccine appears not to exceed six months after the initial series or stimulating dose; and suitable protection cannot be expected unless the vaccine has been administered at least four weeks prior to the onset of disease or two weeks before exposure. In this connection, Topping, Henderson and Bengtson [19] have brought out the importance of the stimulating dose of vaccine in producing a high titer antibody that will persist for a considerable period of time.

SEROLOGIC DIAGNOSIS

The discovery of the Weil-Felix agglutination test, employing suspensions of certain strains of Proteus provided a serologic reaction which was extensively used in the diagnosis of typhus fever. This reaction, although nonspecific, was of great value. Subsequently it became known that this reaction not only failed to differentiate between certain members of the group of rickettsial diseases but also did not differentiate between epidemic and murine typhus. Such distinction is of importance in survey and control work with typhus fever. This differentiation also proved to be desirable in the case of troops who, during the past war, became infected with typhus in many parts of the world.

The successful effort of Cox [8] in cultivating rickettsias in the yolk sac of the fertile hen's egg and Craigie's [10] demonstration of the ether method of extracting such cultures led to the preparation of a rickettsial antigen with which serologic studies (agglutination and complement fixation) could be performed.

Bengtson [20] described a complement fixation test for murine typhus. This complement fixation reaction, as subsequently developed and elaborated, not only clearly differentiated typhus from other rickettsial diseases but also served to separate epidemic from murine typhus provided that certain precautions, as outlined by Plotz, Wertman and Bennett [21] were closely followed. These investigators showed that when the rickettsial suspensions were rendered free of soluble antigen, specific complement-fixing antigens were obtained with which these closely related diseases could be differentiated.

The serologic response in acquired epidemic typhus fever is now well defined and established.[22] The presence of agglutinins in rising titer for the Proteus OX 19 bacillus may be demonstrated between the fourth to thirteenth day, usually about the beginning of the second week. The titer rises during the second week to reach its maximum in early convalescence and usually disappears about three months after onset. Complement-fixing and rickettsial agglutinating antibodies can be demonstrated during the second week of disease.

17. Gold and Fitzpatrick,[16a] Topping.[16c]
18. Ding,[16b] Ecke, Gilliam, Snyder, Yeomans, Zarafonetis and Murray.[16d]

19. Topping, N. H.; Henderson, R. G., and Bengtson, I. A.: Epidemic Typhus Fever: Studies of Epidemic Typhus Vaccine, in Topping, N. H., and others: Studies of Typhus Fever, National Institute of Health Bulletin 183, Federal Security Agency, United States Public Health Service, 1945, p. 65.
20. Bengtson, I.: Complement Fixation in Endemic Typhus Fever, Pub. Health Rep. **56**: 649 (March 28) 1941.
21. Plotz, H.; Wertman, K., and Bennett, B. L.: The Serological Pattern in Epidemic Typhus Fever: I. The Development of Complement-Fixing Antibodies, Division of Virus and Rickettsial Diseases, Army Medical School, Army Medical Center, Washington, D. C., unpublished data.
22. Plotz, H.: The Significance of the Serological Reactions in the Diagnosis of Rickettsial Diseases, in Transactions of the First Inter-American Conference on Typhus Fever, Mexico City, 1945, to be published.

Rickettsial agglutination reaches a nonsignificant titer in late convalescence, while the complement-fixing antibody seems to persist for years after an attack. Indeed, Plotz [22] has found complement-fixing antibodies in epidemic and murine typhus in 2 instances as long as thirty-two and twelve years subsequent to the active infection.

Recently the development of serologic response in man after the administration of epidemic typhus vaccine has been studied by Topping, Henderson and Bengtson [19] and Zarafonetis.[23] These studies briefly show that while such vaccination calls forth epidemic complement-fixing antibodies in low titer there is usually little or no response with the Weil-Felix test. While there is an increase in complement fixation titer as a result of booster vaccination, the trend is still for a return to the prebooster level within several months after the booster injection.

When a person who has received typhus vaccine becomes infected with epidemic typhus, the Weil-Felix reaction, rickettsial agglutination and complement-fixing antibodies appear somewhat earlier than in nonvaccinated persons [24] but continue to rise and eventually yield a serologic picture similar to that in the nonvaccinated patient. In general the titer obtained with complement-fixing epidemic antigen exceeds that with murine antigen, but occasionally considerable cross fixation may be observed.[24a] Until further data are obtained it is therefore unwise to depend solely on the complement fixation reaction for differentiation between epidemic and murine typhus in those persons who have been previously vaccinated.

In the patient who contracts murine typhus subsequent to immunization with epidemic typhus vaccine, Plotz and Wertman [25] and Zarafonetis and his co-workers [24a] have found that complement-fixing epidemic antibodies may be evoked in substantial titer, thus rendering differentiation impossible by the complement fixation reaction alone. Such differentiation, according to Plotz and Wertman,[25] can only be achieved by using the specific rickettsial agglutination test.

The serologic reactions [26] in the 5 cases reported here are summarized in table 3. Agglutinins for Proteus OX 19, while generally not present in the preinfection stage, appeared in low titer by the seventh to ninth day. In 2 of the 4 instances in which this test was carried out the titer never exceeded 1:80, while in the remaining patients (cases 2 and 5) the titer reached a peak of 1:1,280 and 1:640 during the third week. The titers dropped rapidly to attain a negative value except in case 5, in which a value of 1:40 was found almost a year following infection.

Complement-fixing antibodies were found in low dilution prior to infection in all 3 instances in which the test was performed. These titers (1:8, 1:8 and 1:10) were due to immunization with vaccine. In case 2, in which tests were carried out daily during the first week of disease, the complement fixation titer rose from 1:8 to 1:32 on the fifth day, 1:64 on the seventh day, 1:128 on the eighth day, 1:256 on the twelfth day and 1:512 on the nineteenth day. This illustrates in excellent fashion the early and rapid rise of complement-fixing antibodies in the previously vaccinated subject. Although the serologic course was not followed as early and as consistently in the remainder of the cases, the results in general show that complement-fixing antibodies were rising rapidly by the end of the first week to reach their peak in the second or third week. Such peak titers ranged between 1:128 to 1:1,280 in the 5 cases studied and fell off slowly in late convalescence. The titer was still positive at 1:10 in case 1 almost two years after infection, at 1:20 in case 2 one and a half years after infection and at 1:20 in cases 4 and 5 a year after infection. In case 3, which has been followed only four months since the onset of disease, the complement fixation titer remains positive in a dilution of 1:320. In all instances the differentiation with epidemic and murine antigens was clearcut.

Although the complement fixation titer obtained in case 5 was never above 1:128, a value which may be observed on occasion with vaccination alone, the diagnosis of epidemic typhus seems valid on the basis of the persistence of such antibodies for a prolonged period and the clinical history of exposure and onset of disease identical with that in case 4.

It was possible to obtain data on specific rickettsial agglutination throughout the course of disease only in case 3. Here the appearance and rise in titer roughly paralleled that of the Weil-Felix reaction, although higher values were obtained and agglutinins persisted for a longer time. In case 2, in which the test was performed almost two years after infection, and in cases 4 and 5, in which the test was carried out one year subsequent to the active attack of disease, the values obtained were negative.

The above results are consistent with those already recorded in the literature and confirm the usefulness of the complement fixation reaction and rickettsial agglutination test in the diagnosis of typhus following vaccination. They also demonstrate that although the Weil-Felix reaction may prove useful in such confirmation the titers usually obtained are low, and conclusions must be based on a series of examinations rather than on one or two tests.

SUMMARY

In the period Jan. 1, 1942 to Dec. 31, 1945 there were reported in the entire United States Army 64 cases of epidemic typhus, 603 cases of murine typhus and 6,685 cases of tsutsugamushi fever, or scrub typhus. There were no deaths during this period from epidemic typhus fever.

While no conclusions can be drawn concerning a reduction in the incidence of epidemic typhus by prophylactic immunization with Cox type ether-extracted typhus vaccine, it appears definite that such vaccination does serve to greatly modify the disease if it occurs in an adequately vaccinated person and does render the chance of death from typhus practically nil.

The clinical records and serologic observations in 5 cases of epidemic typhus fever occurring subsequent to prophylactic immunization are reported. In all 5 cases it was highly probable that infection was sustained by pulmonary inhalation or conjunctival absorption of dust which contained infected louse feces.

Complement-fixing antibodies for epidemic typhus persisted for prolonged periods of time, while the Weil-Felix reaction and the specific rickettsial agglutination became negative in late convalescence.

23. Zarafonetis, C. J. D.: Serologic Studies in Typhus-Vaccinated Individuals: I. The Effect of a Stimulating Dose of Typhus Vaccine on the Weil-Felix and Complement-Fixing Antibodies, J. Immunol. **51**: 365 (Nov.) 1945.

24. (a) Zarafonetis, C. J. D.; Ecke, R. S.; Yeomans, A.; Murray, E. S., and Snyder, J. C.: Serologic Studies in Typhus-Vaccinated Individuals: III. Weil-Felix and Complement-Fixation Findings in Epidemic Typhus Fever Occurring in the Vaccinated, J. Immunol. **53**: 15 (May) 1946. (b) Plotz.[22]

25. Plotz, H., and Wertman, K.: Modification of Serological Response to Infection with Murine Typhus by Previous Immunization with Epidemic Typhus Vaccine, Proc. Soc. Exper. Biol. & Med. **59**: 248 (June) 1945.

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THE VALUE OF ENDOTRACHEAL INTUBATION

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In a previous article [1] I described a method for the removal of accumulated tracheal secretions by suction through an endotracheal tube over a long period of time. I showed that this is a life-saving measure and can often be used when bronchoscopy is impossible and tracheotomy is not feasible. I have now succeeded in accumulating further cases to demonstrate the life-saving nature of intubation, apart from its already familiar use during anesthesia. These are cases which came to my attention during the recent war, but the conditions, the treatment and the lessons learned will apply as well to civilian life. Anesthesia, asphyxia, trauma of the respiratory system and trauma to the central nervous system resulting in unconsciousness, concussion or paralysis all give rise to weakness of the respiratory musculature and depression of ciliary activity. Obtundation of the cough reflex and depression of ciliary activity, which are the normal cleansing mechanisms of the lung, soon result in the accumulation of tracheobronchial secretions. These must be removed. I am concerned in this paper with severely wounded men whose normal pulmonary protective functions are depressed, not with the patient who can effect this cleansing by himself if he is encouraged to change his position and to cough. To date four methods for tracheobronchial drainage in the depressed or weakened person have been described. They are as follows:

1. The single catheter method, in which endotracheal aspiration is accomplished by the use of a no. 16 French soft rubber urethral catheter. It has been fully described elsewhere.[2] During the course of the aspiration should the vocal cords close around the narrow catheter the airway will become blocked. If suction is continued, collapse of the lung could occur. The proponent of this method uses it only when equipment is not available for other methods, and he warns that "unless intermittently applied, the suction will provoke severe coughing and cyanosis, and accordingly, the suction should be used for periods of only several seconds each, the patient being allowed to take a few deep breaths between each period of suction." [2b]

2. Suction with a small catheter through a wide bore endotracheal tube. This is the method which is now termed tracheobronchial toilet in the official nomenclature of the American Society of Anesthesiologists. It was described by Franz Kühn of Cassel, Germany, in 1912.[3] Kühn advocated the use of the wide bore tube in the trachea, because it acted as a speculum preventing glottic spasm and the resultant damage of lung collapse as mentioned heretofore. It thus assures a good airway while suction is being applied by means of the small catheter. Various technics embodying the essential principle of Kühn's method have been described in the intervening years.[4]

3. Suction through a bronchoscope.
4. Suction through tracheotomy.

Having these four potent weapons to combat the accumulation of pulmonary secretions, the physician employs whichever is best suited to the case in hand.

REPORT OF CASES

CASE 1.—L. Q., aged 25, received a penetrating wound of the right side of the chest with a sucking pneumothorax on July 19, 1944 near Périers, France. He was given ½ grain (0.03 Gm.) morphine on the battlefield and 2 units of plasma at the collecting station. Anesthesia was commenced at 45 minutes past 3 o'clock and intubation was performed. There was blood in the trachea. The thoracic wounds were debrided and closed. In the evening immense emphysema of the face, neck and thorax with severe respiratory distress developed in the patient. Blind intubation was performed through the right nostril with considerable relief of the respiratory distress. Cutaneous incisions were also made to relieve the pressure. The next day the emphysema continued, and suction was performed at intervals to remove tracheobronchial secretions. On the second day at 45 minutes past 2 o'clock the tube was removed, as the emphysema had subsided enough that obstruction no longer existed. The patient could cough efficiently and coughed up some frothy blood-tinged mucus during the rest of the day. He also had a whispered voice and a slightly sore throat, but the airway was clear. During the next few days the whispered voice persisted, and he continued to cough up bloody mucus. On the sixth day his voice returned, but it was hoarse. I examined his larynx and could see no edema, hemorrhage or hematoma, but there was hyperemia. On the tenth day his speech was normal. Most of the intense emphysema had by now subsided. To summarize, the tube was left in place for forty-one hours. There was dysfunction and hyperemia of the organ of speech for eight days. Thereafter his speech was normal.

CASE 2.—L. L., aged 21, on June 24, 1944 during the drive to Cherbourg, France, sustained a puncture wound of the left side of the chest posteriorly with indications of massive hemorrhage inside the thorax. Sixteen hundred cubic centimeters of blood had been withdrawn from his chest by paracentesis, but because of continued respiratory distress and cyanosis the surgeon contemplated a thoracotomy to ligate a bleeding intrathoracic vessel. While the surgeons were preparing to operate I passed a no. 10 Magill tube through the right nostril blindly into the trachea of the conscious patient. After the removal of large amounts of bloody mucous secretions, the patient's condition improved until he was able to aspirate his own trachea. It was apparent that his respiratory difficulty was solely due to accumulated tracheobronchial secretions and not due to compression by a mass of blood, i. e., there was no bleeding intrathoracic vessel. Surgical intervention was deferred, and recovery was uneventful.

CASE 3.—M. D., aged 25, received a gunshot wound of the left cheek near Mortain, France, on Aug. 11, 1944. The bullet had perforated the left cheek at the level of the second upper molar and had lacerated the tongue, but it could not be determined exactly where the bullet lodged. The patient was conscious and could speak. He was given a solution of ⅛ grain (0.008 Gm.) morphine and 1/100 grain (0.0006 Gm.) atropine subcutaneously. The nose was cocainized. Right blind nasal intubation was performed with ease, and he was anesthetized with pentothal sodium, nitrous oxide, oxygen and ether. The throat was packed. The wounds were debrided, fragments of bone were removed and, after much probing and pulling at what was thought to be the bullet, the surgical operation was ended without removing the bullet. After the operation the patient did not respond as was anticipated, despite the fact that anesthesia had been light. The mandible was relaxed, and there was no response to nociceptive stimuli. The endotracheal tube was left in place. When I saw him two hours after the operation the pharynx was full of blood, and blood was coming out of the tracheal tube with each respiration. The patient's breathing was obstructed and he was hypoxic. His blood pressure was 80 systolic and 20 diastolic, his pulse rate was 140, and his condition was adjudged critical. Suction through

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2. (*a*) Haight, C.: Intratracheal Suction in the Management of Post-operative Pulmonary Complications, Ann. Surg. **107**: 218-228 (Feb.) 1938. (*b*) Haight, C., and Ransom, H. K.: Observations on the Prevention and Treatment of Postoperative Atelectasis and Bronchopneumonia, ibid. **114**: 243-262 (Aug.) 1941.

3. Kühn, F.: Meltzers Verfahren und die perorale Intubation, Zentralbl. f. Chir. **39**: 73-75 (Jan. 20) 1912.

4. (*a*) Hathaway, H. R., and Leigh, M. D.: Airway Below the Larynx, Tr. Am. Soc. Anesthetists **5**: 56-63, 1939. (*b*) Waters, R. M.: Tracheobronchial Toilet, Brit. J. Anaesth. **18**: 1-10 (March) 1942.

the endotracheal tube resulted in much improvement within fifteen minutes. Throughout the night suction and oxygen were employed.

The next day examination of the spinal fluid and the eye grounds revealed the presence of a basilar fracture of the skull. He remained unconscious, but the chest remained clear to auscultation.

On the second day the tracheal tube was still in place. He was rapidly regaining consciousness. He was restless and responded to nociceptive impulses, although the sensorium was still somewhat clouded. At 10 p. m. the endotracheal tube was withdrawn, since during the day he had improved and had become conscious and cooperative enough to cough up any tracheal secretions. The tube had been in forty-eight hours. The next day he required suction of the hypopharynx only once, and from this time on he was able to cough well enough to clear the tracheobronchial tree of secretions. When I saw him on the fourth day he was talking, and there was no hoarseness. He was alert but not yet sitting up. I examined his larynx. It was normal in every respect.

CASE 4.—J. M., aged 35, was wounded Dec. 12, 1944 near Eschweiler, Germany. The patient had a perforating wound of the upper lip and the tongue and was bleeding into the throat. When I arrived the ward surgeon was sucking out the throat and trying to suture the tongue. The patient's color was gray and he was gasping. Right blind nasal intubation was quickly performed, and a large amount of blood was sucked from the trachea. His respiratory rate and his color improved. Suction was continued, and a pack was placed in the hypopharynx and mouth around the endotracheal tube. This served to compress the lacerated tongue and to prevent more blood from going down into the trachea. This patient was operated on several hours later, at which time the left external carotid artery was ligated and the tongue sutured. Recovery from then on was satisfactory.

CASE 5.—R. C., aged 19, had been wounded in the neck by a bullet several weeks before I saw him Jan. 21, 1945. At that time he had a fracture of the first dorsal vertebra with traumatic myelitis below this level. Because of weakness of the thoracic muscles he was unable to cough and expectorate, and partial pulmonary atelectasis had developed. A Magill no. 10 endotracheal tube was passed, using cocaine analgesia, and tracheobronchial suction was performed with a urethral catheter passed through the endotracheal tube. Considerable clinical improvement followed immediately, although follow-up roentgenologic examination showed no change in the pulmonary picture. Tracheobronchial aspiration was performed using the same technic six times in the next seven days, each time with distinct clinical improvement. Nightly refilling of the bronchial tree was the indication for the repetition of the procedure. Transoral tracheal intubation was difficult and was accompanied by considerable discomfort to the patient because of his neck wound. Therefore it was thought best to perform tracheotomy, which would permit more frequent tracheobronchial aspirations, and this was done. Following this the atelectasis cleared in a few days, and the condition of the patient improved enough for him to be sent back to America.

CASE 6.—Mr. H., aged 65, a British civilian, was hit by a large United States Army truck and sustained fractures of the left femur and the pelvis and a blow in the left frontotemporal region. I saw him Nov. 18, 1943, two days after injury, at which time coarse bubbling rales could be heard from the doorway. He was sitting up in bed with a great deal of respiratory distress evidenced by rapid, labored breathing, retraction at the sternal notch, dilated neck veins and activity of the accessory respiratory muscles. He was moderately confused and aphasic. I performed blind nasotracheal intubation without cocainization five times in the course of the day, through alternate nostrils. There was little if any improvement, so in the evening I decided to leave the tube in place. Secretions were aspirated through this tube over a period of sixty hours. It was here that I learned an important lesson, because not until forty-eight hours had passed did I realize that these aspirations had been carried out too infrequently and in a desultory manner; it was only after the suction had become more vigorous and frequent in nature that decided improvement occurred. The temperature, which had been 103 F., was now normal. The character of the pulse and the respirations was greatly improved. I withdrew the tube, and throughout the day he coughed up copious amounts of sputum from the lungs. He was aphonic for one day, but the airway was free. The next day he was so much improved that the surgeons inserted a pin through the distal end of the femur. He continued well for two days with a normal temperature and a pulse rate below 100. At this time I myself was confined to bed with an infection of the respiratory tract. There was no one to skillfully aid and encourage him in the pulmonary toilet, and he again began to accumulate tracheal secretions. After a few days he died. Autopsy was not performed; neither was the glottis and trachea examined in death by laryngoscopy.

COMMENT

The value of endotracheal intubation as a dramatic life-saving procedure in the unanesthetized person is again herein clearly shown. Moreover, further evidence is offered that the human larynx will withstand repeated intubation, and that a tube may be left in place for a long time without permanent harmful results. There is nothing new in these observations, for William MacEwen of Glasgow recorded in 1880 that he had saved several patients from death by asphyxiation by using an endotracheal tube to provide the necessary airway. In one case he kept the tube in the trachea thirty-six hours and in another, thirty-five hours.[5] But it seems that in medical science the value of some procedures must be repeatedly affirmed before they become part of the physician's daily armamentarium. Although these are all instances arising in military life, the same situations could and do occur in civilian life. Automobile accidents result in trauma to the central nervous and respiratory systems. Brain tumors, infections, poliomyelitis, asphyxia and drug depression all give rise to weakness of respiratory musculature and depressed cough activity. To combat the evil effects of these accidents and diseases of vital functions, skilled physicians and adequate equipment should be as abundant in civilian life as they were directly behind the frontline of battle. It is not asking too much that every medical student should understand the nature of this problem and should begin his training in the art of endotracheal intubation before graduation. In most of the cases cited here, the method of tracheal aspiration using suction through a soft rubber Magill tube was used. But this, although a simple method, does not mean that other methods cannot and should not be used. The important point, in my opinion, is to recognize the nature of the malady and to institute some form of therapy to remove the offending secretions from the tracheobronchial tree. This may be any one of the four known methods for drainage of the trachea, the choice being dictated by the nature of the case in hand and the capacity of the physician whose lot it is to perform the task. Skill in one form may be predominant, and the physician will naturally elect to use the method with which he is most familiar. Skill and dexterity should have their sanction: the privilege to make decisions and perform technics with a tranquil mind and without interference.

CONCLUSIONS

1. Endotracheal intubation is herein shown to be a life-saving measure.

2. The human larynx withstood an indwelling catheter for forty-one and forty-eight hours, respectively in 2 cases, without permanently harmful results.

5. MacEwen, W.: Clinical Observations on the Introduction of Tracheal Tubes by the Mouth Instead of Performing Tracheotomy or Laryngotomy, Brit. M. J. 2: 122-124 and 163-165, 1880.

ESOPHAGEAL LEIOMYOMA

Report of a Successful Resection

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Benign tumors of the esophagus are rare and usually are encountered as incidental findings at autopsy. Moersch and Harrington [1] have stated that of 11,000 patients complaining of dysphagia only 15 had benign esophageal tumors as a basis for their complaint. In a review of 7,459 necropsies they observed 44 of these tumors. In 6,001 postmortem examinations at the University of Chicago 11 benign esophageal tumors have been found. Case reports and reviews concerning approximately 200 such tumors have been published.[2] A wide variety of benign neoplasms occur in the esophagus: adenoma,[3] papilloma,[4] polyp,[5] fibroma,[6] myxofibroma,[7] neurofibroma,[8] hemangioma,[9] lipoma,[10] ostechondroma [11] and the most frequent form, myoma.[12]

There have been few reports on the surgical treatment of benign esophageal tumors. This is due not only to the paucity of these lesions but also to the relatively recent advance of surgery to a stage where intervention is advisable. Three cases of surgical resection of esophageal myoma have been published, of which only 1 was successful. This was described in Ohsawa's remarkable discussion in 1933.[13] He described a 43 year old woman who had experienced dysphagia for twenty-four years. A diagnosis of idiopathic esophageal dilatation was made. In performing an esophagocardioplasty for relief of the cardiospasm, Ohsawa encountered an unsuspected submucosal myoma about 1 cm. in diameter, which he enucleated.

Another case was reported by Harrington and Moersch.[14] Their patient was a 39 year old man, who gave a history of asthmatic bronchitis and hay fever of twenty years' duration. No dysphagia or regurgitation had occurred. Roentgen examination revealed an increased density in the left side of the inferior posterior mediastinum. The lower end of the esophagus was deformed and displaced to the left. These observations suggested a diaphragmatic hernia. Endoscopic examination showed that the esophagus was irritated by regurgitated gastric juice and confirmed the deflection previously noted. Through a left transpleural route, the esophagus was visualized and its lower 5 inches (12.7 cm.) found to be surrounded by a lobulated tumor mass which extended to the cardia. The lower fourth of the esophagus, the major portion of the tumor and the cardia were resected, and an esophagogastrostomy was performed. The patient expired on the fourth day after the operation from bilateral bronchopneumonia. These authors [14] described another myoma which occurred in a 56 year old woman, but since it was located at the cardioesophageal junction it was impossible to state definitely that it was of esophageal origin.

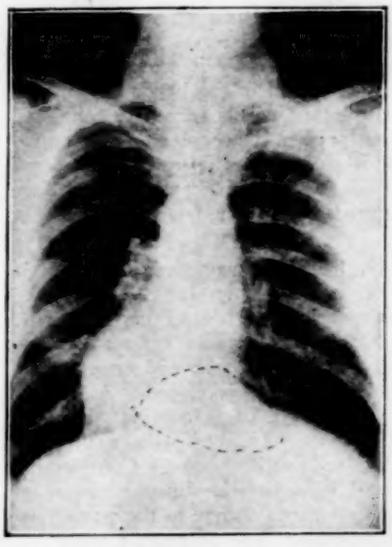

Fig. 1.—Roentgenogram of the chest showing the leiomyoma as a rounded mass of increased density in the right inferior mediastinum.

Also a large cardioesophageal myoma has been successfully resected by Brock.[15]

Harper and Tiscenco [16] mention the case of a 41 year old man who for three years had experienced tightness and distention in his epigastrium shortly after eating. This was of an intermittent nature and was alleviated by vomiting. Occasionally a choking sensation was present. Because of these symptoms he was placed on ulcer management, which failed to bring relief. Esophagoscopy showed a mucosa-covered tumor in the right lateral wall of the esophagus 30 cm. from the incisor teeth. A filling defect in the lower half of the esophagus without obstruction was apparent at roentgen examination. At operation Dick [17] encountered a mass on the posterolateral wall of the esophagus extending upward posterior to the aortic arch. Histologically the resected tumor was a leiomyoma. The patient succumbed on the fourth day, and at postmortem examination bilateral "wet lungs" were found.

Recently a large leiomyoma of the lower thoracic esophagus was successfully resected at the University of Chicago Clinics. A detailed report of this case seems of value.

From the Department of Surgery of the University of Chicago.

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REPORT OF A CASE

A 46 year old Polish laborer presented himself at the University of Chicago Clinics Jan. 22, 1946. He was seen first in the emergency clinic with complaints of epigastric distress and pain in both costovertebral angles. Although this had been continuous for six weeks it had been especially severe for only two days. Closer inquiry revealed that for eighteen months he had noticed occasional pain in the lower part of his chest on the right side. His family physician considered this due to pleurisy and applied adhesive strapping to his chest. This brought relief for several months, after which the pain recurred and persisted with exacerbations and remissions until his admission. Several of the acute episodes of pain were accompanied by nausea, vomiting and frontal headaches. He had experienced some anorexia and had lost 14 pounds (6.4 Kg.). At no time had dysphagia been present. Inquiry by system and history were not contributory. There was decided tenderness in both costovertebral angles, but the remainder of the physical examination revealed no abnormalities. Hemoglobin determination, red and white blood cell counts and routine urinalysis were within normal limits. The blood Wassermann test was negative. Stereoroentgenograms of the thorax revealed a large, rounded

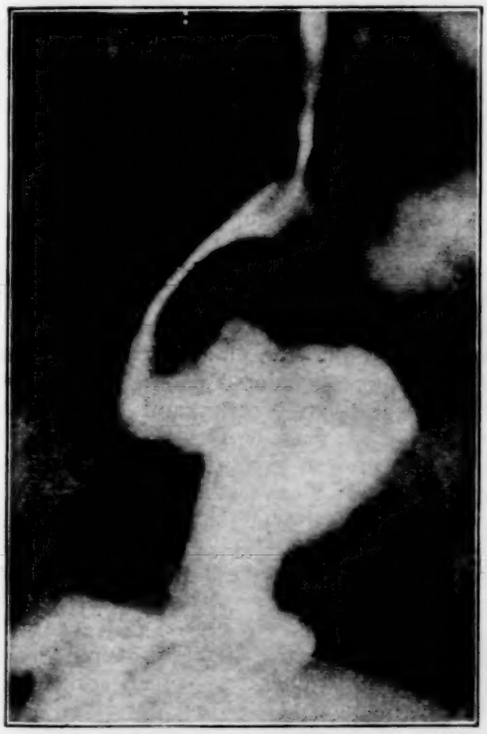

Fig. 2.—Lower esophagus and stomach during ingestion of a barium meal. The lower esophagus is compressed and deviated while the upper fifth of the stomach lies above the diaphragm.

mass of increased density in the lower posterior mediastinum, suggestive of a diaphragmatic hernia (fig. 1). Fluoroscopy during a barium swallow showed the lower part of the thoracic esophagus to be displaced to the right, the position of the esophagus corresponding to the right margin of the previously noted mass (fig. 2). Approximately the upper fifth of the stomach lay within the mediastinum, but it seemed to be insufficient in volume to have displaced the esophagus so widely. Barium studies of the small intestine and large intestine were done with the thought that possibly these structures also might have passed through the diaphragmatic defect. This was not found to be the case. Intramural or extrinsic tumor was not considered likely. A diagnosis of eccentric diaphragmatic hernia was made and operative intervention advised.

On Feb. 23, 1946 under positive pressure, ethylene-oxygen anesthesia the left pleural cavity was entered through the bed of the resected ninth rib. A more adequate exposure was obtained by removal of 2 cm. segments of the posterior parts of the eighth and seventh ribs, with division of the intervening intercostal structures. The left lung was retracted superiorly after division of the pulmonary ligament. Palpation of the mediastinum revealed a large, firm mass in the region of the lower esophagus. The mediastinal pleura was incised and the mediastinal cavity explored. The esophageal hiatus was found to be enlarged to a diameter of 5 cm., and the greater part of the fundus of the stomach protruded through this opening. The

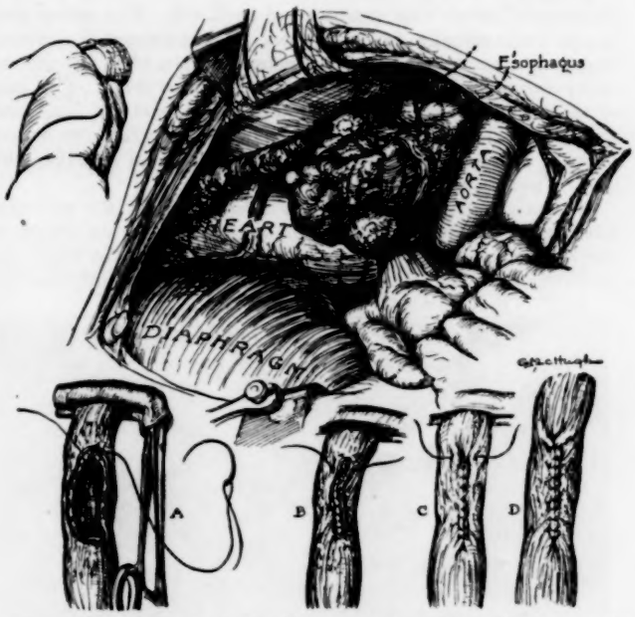

Fig. 3.—Operative sketch showing the location and relationships of the tumor and the hernia as well as the incision and method of repair.

diaphragm was opened obliquely along its anterolateral aspect and the liver, kidney and spleen identified in their normal locations. It was obvious from this that the palpable mass was a tumor and not a visceral herniation. The stomach was replaced into the abdominal cavity, the diaphragm repaired by use of a

Fig. 4.—Posterior view of the tumor and herniated stomach.

continuous suture of doubled 0 chromic catgut, and the hiatus reconstructed to a diameter of 2 cm. The lower esophagus together with the mass was delivered into the operative field. The tumor measured 7 by 7 by 10 cm. and partially surrounded

the lower part of the esophagus. It took its origin from the left posterolateral wall of the esophagus 6 cm. above the diaphragm. The tumor mass was irregularly lobulated, firm, and sharply delineated from the surrounding tissues (figs. 3 and 4). Microscopic examination of a frozen section revealed it to be a leiomyoma. Because of its origin in the wall of the esophagus, it was necessary to excise an ovoid portion of the left posterolateral wall measuring 3 by 7 cm. This defect was closed longitudinally by two rows of interrupted 0 chromic catgut sutures. A de Pezzer catheter was placed in the pleural cavity through a stab wound in the tenth interspace. The wall of the chest was closed in anatomic layers, and the lung was reinflated. While the operation was being performed the patient received 1,200 cc. of whole blood and 1,500 cc. of isotonic solution of sodium chloride intravenously.

Intranasal oxygen was given for two days after the operative intervention. The administration of oral fluids was begun on the fifth day. Other than a slight amount of pain along the external operative site the patient had no complaints, and his

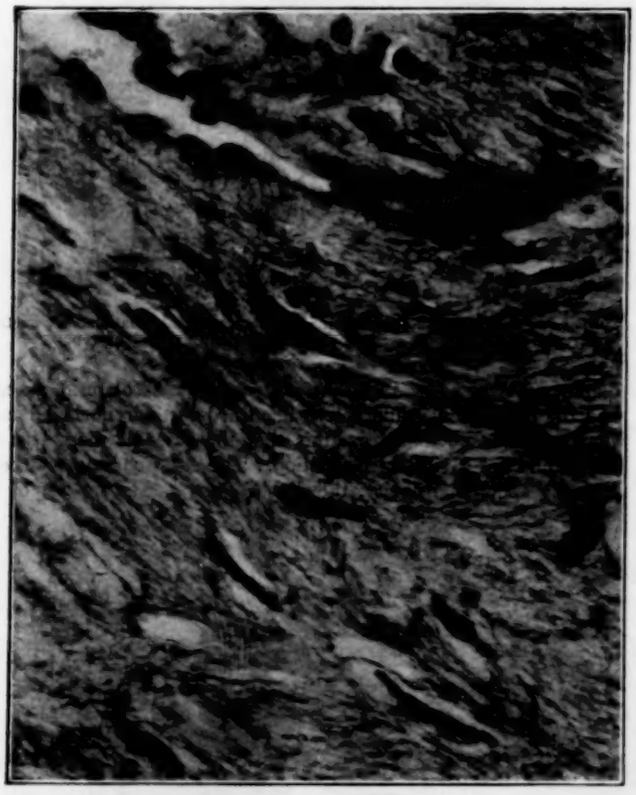

Fig. 5.—Photomicrograph of the tumor showing strands of smooth muscle cells about the hyalinized vessel.

postoperative course was uneventful. He was discharged from the hospital on the thirteenth day after the operation.

Roentgenologic examination of his chest and fluoroscopy during a barium swallow one month after the discharge of the patient showed a slight deviation of the esophagus to the right in its lower part but no recurrence of herniation. The patient has had no complaints or evidence of former symptoms since discharge, and when last seen July 1 he was anticipating his early return to hard labor.

The pathologic specimen consisted of an ovoid mass of nodular, firm tissue, which measured approximately 7 by 7 by 10 cm. and weighed 178 Gm. On one side was a deep groove through which the esophagus had coursed, and attached here was a 3 by 7 cm. ovoid piece of esophageal wall, from which the tumor appeared to originate. On cut section the tissue was uniformly firm, and many small cystic areas, none larger than 1 mm., were present.

Microscopically the tumor was composed of smooth muscle cells arranged in strands and whorls separated by septums and bundles of connective tissue (fig. 5). The relative amounts of connective tissue and muscle fibers varied greatly and were similar to the variability present in uterine leiofibromyomas. In those areas in which the collagenous tissue predominated the muscle cells were sparse and atrophic. Where the muscle fibers were more abundant, their cells were large and vacuolated. In no place was there any suggestion of cross striation of the muscle fibers. The configuration of the muscular and connective tissue suggested a multilobular appearance, as though there were multiple centers of growth. Phosphotungstic acid and hematoxylin stains identified myofibrils in spindle-shaped cells coursing among connective tissue strands.

The tumor was sharply demarcated from peripheral fatty and areolar tissues, but no distinct capsule was present. The entire tissue contained numerous poorly developed, endothelium-lined cavities, some of which contained red blood cells, while others held a clear fluid or were empty. The majority of these vascular spaces had a dense hyaline wall. In many instances hyaline thrombi were present, and not infrequently the vessel was completely obliterated. Often the spaces were compressed to mere slitlike channels. Focal areas of fatty, hyaline and, infrequently, calcific regression were present, especially near the thrombosed and densely hyalinized vessels.

There was an occasional perivascular focus of lymphocytic infiltration. In some instances these accumulations resembled lymph follicles. In other places this invasion was more diffuse and consisted of a mixture of eosinophils and lymphocytes.

No nerve fibers or ganglion cells were seen in any of the sections.

COMMENT

Benign tumors of the esophagus can be divided into two general types, depending on whether they originate from the mucosa and submucosa or from the muscularis. This is a distinction applicable not only to the histologic type but to the clinical symptomatology as well. While the papillomas, adenomas, myxofibromas, lipomas and hemangiomas arise from the submucosal area, the most commonly observed type, the myoma, originates from the muscular coats of the esophagus. The submucosal neoplasms grow into the lumen of the esophagus, usually becoming pedunculated as a consequence of the continued deglutitive process, and produce dysphagia because of their bulk. These are the spectacular patients who present themselves with a tumor hanging from between their teeth. A history of vomiting forth and then swallowing a long pedunculated mass may be given.

Myomas and other intramural tumors produce symptoms by their expansile growth into the adjacent structures. Epigastric or retrosternal distress, intermittent dyspnea and cough are the most commonly reported symptoms. Seldom does dysphagia occur.

Although myomas of the alimentary tract are frequent at necropsy, they appear least often in the esophagus.[18] There they are usually small and have little, if any, clinical significance. Rose [19] in a review of 49 autopsies found the tumor multiple in 11 of 46 instances and commonest in the distal third of the esophagus. In only 4 of his cases did the myomas produce symptoms. Their size varies from a few millimeters to several centimeters in diameter. Stewart [20] discussed 2 cases in which the tumors were associated with diverticula, a situation previously noted by Monro.[20] Myomas of the esophagus seldom involve its entire circumference and only produce symptoms when they attain large size or become malignant. That this last possibility is unlikely is suggested by French and Garland and others [21] who have reviewed sarcomas of the esophagus.

18. (*a*) Golden, T., and Stout, A. P.: Smooth Muscle Tumours of the Gastro-Intestinal Tract and Retroperitoneal Tissues, Surg., Gynec. & Obst. **73**: 784-810, 1941. (*b*) Meissner, W. A.: Leiomyoma of the Stomach, Arch. Path. **38**: 207-209 (Oct.) 1944.

19. Rose, J. D.: Myomata of the Oesophagus, Brit. J. Surg. **24**: 297-308, 1936.

20. Stewart, J. D., Jr.: Myoma of the Esophagus with Associated Diverticula, Arch. Path. **12**: 77-84 (July) 1931.

21. French, L. R., and Garland, L. H.: Leiomyosarcoma of the Esophagus, Am. J. Roentgenol. **45**: 27-31, 1941.

Myomas can arise from either of the muscular layers of the esophagus although more begin in the longitudinal layer according to Rose. Histologically, leiomyomas, rhabdomyomas [22] or tumors composed of both smooth and striated muscle fibers are found. Pichler [23] has described an esophagus containing multiple leiomyomas which included striated muscle fibers and ganglion cells. These tumors undergo hydropic, fatty and hyaline degenerative changes, and calcification often occurs after such regression. The blood vessels are scanty and small, frequently exhibiting obliterative processes. Lymph vessels are fairly numerous and may contribute largely to the nutrition of these tumors. Lymph follicles and round cell infiltration are often present, but the inflammation is usually slight.

Abrikissoff [24] described a special variety of striated muscle neoplasm in 1926 which he designated as a myoblastoma. This tumor is composed of primitive myoblasts, and several have been found in the esophagus.[25]

It should be emphasized that dysphagia is seldom a symptom of esophageal myoma. Dysphagia when present, unlike that associated with carcinoma, is rarely progressive to the point of complete obstruction but remains intermittent and usually slight. Since myomas are most frequently located in the posterior mediastinal space their growth causes few symptoms, and those which do result are not pathognomonic. The presence of a myoma should be suspected when indefinite esophageal or intrathoracic complaints are coupled with a posterior mediastinal mass. Symptoms are of variable duration ranging from a few months to several years. It is of interest that of the 4 esophageal myomas which have been treated surgically the correct diagnosis was made preoperatively in only 1 instance (Harper and Tiscenco [16]), and here the myoma was not associated with any other esophageal lesion. Ohsawa encountered his tumor unexpectedly during the course of an esophagocardioplasty for the treatment of cardiospasm of long duration. In the case of Harrington and Moersch and in the case reported here, a diaphragmatic hernia was considered the most likely diagnosis and was found in the latter instance. From a study of the anatomic relations of the tumor it seems likely that development of the leiomyoma preceded the formation of the hernia, which probably was secondary to traction exerted by the expanding tumor mass.

By far the most useful diagnostic procedure in this condition are stereoroentgenograms of the chest with appropriate oblique views and fluoroscopy during the ingestion of barium. The last allows an accurate evaluation of the position of the tumor. Extensive radiologic discussions of benign esophageal tumors have been written.[26] Esophagoscopy further aids in their localization and permits differentiation of some benign or malignant lesions, particularly when an adequate biopsy can be secured. Bronchoscopy is indicated if the tumor is so located that the trachea or bronchi are displaced.

22. Gliński, L. K.: Mixed Polypoid Tumors of the Esophagus, Virchows Arch. f. path. Anat. **167**: 373, 1902; cited by Ewing, J.: Neoplastic Diseases, Philadelphia, W. B. Saunders Company, 1941.

23. Pichler, R.: Ueber einen Fall von multiplen (14) Leiomyomen des Oesophagus, Prag. med. Wchnschr. **22**: 455-457, 1897; cited by Ewing, J.: Neoplastic Diseases, Philadelphia, W. B. Saunders Company, 1941.

24. Abrikissoff, A. J.: Ueber Myome ausgehend von der quergestreiften willkürlichen Muskulatur, Virchows Arch. f. path. Anat. **260**: 215-233, 1926; Weitere Untersuchungen über Myoblastenmyome, ibid. **280**: 723-740, 1931.

25. (*a*) Bade, H.: Ein Beitrag zur Röntgendiagnostik der polypösen Oesophagustumoren, Röntgenpraxis **11**: 174-178, 1939. (*b*) Schatzki, R., and Hawes, L. D.: The Roentgenological Appearance of Extramucosal Tumors of the Esophagus. Am. J. Roentgenol. **48**: 1-15, 1942. (*c*) Harper and Tiscenco.[16]

26. (*a*) Howe, C. W., and Warren, S.: Myoblastoma, Surgery **16**: 319-347, 1944. (*b*) Klemperer, P.: Myoblastoma of Striated Muscle, Am. J. Cancer **20**: 324-337, 1934.

CONCLUSION

Benign esophageal tumors have been discussed, with special reference to their surgical treatment. The first successful resection of a large intramural leiomyoma of the esophagus to be recorded in the literature has been performed.

Clinical Notes, Suggestions and New Instruments

PENICILLIN THERAPY OF GONOCOCCIC ENDOCARDITIS OF THE PULMONARY VALVE

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In the past gonococcic endocarditis has been of interest primarily as a diagnostic problem. The mortality rate in acute endocarditis due to the gonococcus approached 100 per cent. With the advent of the sulfonamide drugs and the antibiotics, the treatment of gonococcic endocarditis is not without hope. The National Research Council received reports of penicillin therapy in 5 cases of acute gonococcic endocarditis. Recoveries or clinical arrests were reported in 3 of these cases.[1]

REPORT OF A CASE

A Negro girl aged 18 was admitted to the hospital on March 21, 1945. Her chief complaints were pain in the lower part of the abdomen and constant headache of one week's duration, and vomiting for one day.

The present illness began two weeks earlier, at which time she first noted weakness, listlessness and easy fatigability. She had been seen by a local physician because of delayed menstruation. With the onset of her menstruation one week before admission, she began to suffer pain in the lower part of the abdomen which increased in severity and which persisted. She had had for a week before entry a thick white vaginal discharge. For three days before entry she had chills and fever associated with nausea. On the day of admission she had vomited on several occasions. Her family observed that her eyes were yellow.

Her past history was noncontributory except that she had had measles and mumps as a child. There had been a normal pregnancy with delivery of a healthy child nine months before the present illness. Her family history was entirely negative.

The physical examination on admission revealed a temperature of 101 F., a pulse rate of 90 per minute, a respiratory rate of 18 per minute and a blood pressure of 100 mm. of mercury systolic and 70 mm. of mercury diastolic. She was a well developed and well nourished Negress, who was obviously ill and uncomfortable. The mucous membranes were pale and the scleras were decidedly icteric. The heart was of normal size and shape on percussion; heart sounds were of good quality. The second sound over the aortic area was equal in intensity to the second sound over the pulmonic area. There were no thrills; no murmurs were noted. Examination of the abdomen revealed definite tenderness in the right upper quadrant and pronounced tenderness deep in both lower quadrants. No masses or viscera were palpable. Pelvic examination disclosed tenderness in both fornices with pain on movement of the cervix. The fundus of the uterus was of normal size, shape and position. There was a thick white discharge from the cervix. The remainder of the examination was noncontributory.

From the Central Dispensary and Emergency Hospital and the Department of Medicine, George Washington University School of Medicine.

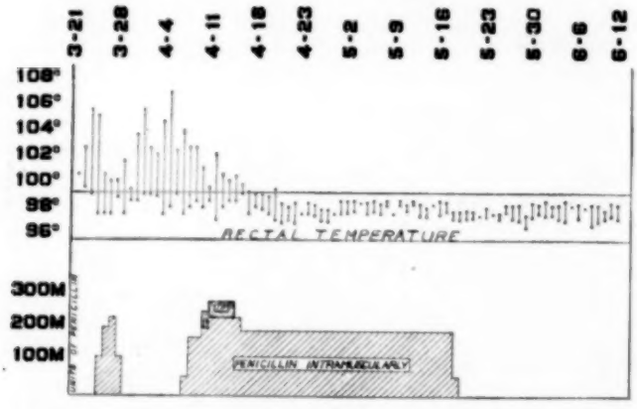
The assistance of Capt. Guy N. Richards, Medical Corps, Army of the United States, and Lieut. S. Richard Bauersfeld, Medical Corps, Army of the United States, former residents in Medicine, is gratefully acknowledged.

1. Keefer, C. S.: Personal communication to the author.

Laboratory studies on admission revealed the following: the blood had a hemoglobin level of 10.5 Gm. per hundred cubic centimeters; 3,610,000 erythrocytes and 30,300 leukocytes per cubic millimeter, with 96 per cent polymorphonuclear cells. The icterus index was 72 units; the van den Bergh reaction was direct, immediately positive with a total of 12 mg. per hundred cubic centimeters. The Kahn and Kolmer tests were negative. Smear and culture of vaginal secretions were positive for gram-negative intracellular diplococci. Examinations of the blood for leptospira, sickle cells and erythrocyte fragility were negative. Three blood cultures in the first ten days after admission remained sterile.

The patient remained quite ill. The rectal temperature ranged between 99 and 107.4 F. It was noted that the patient had occasionally only one and frequently two peaks of temperature daily. She received a high carbohydrate diet, dextrose solution intravenously and penicillin intramuscularly, in the dosage of 30,000 units every three hours for a total of 690,000 units over a period of three days. With penicillin therapy there was a subsidence of genital signs and symptoms. The diagnosis at this time was catarrhal jaundice and acute pelvic inflammatory disease due to the gonococcus.

One week after admission, a roentgenogram of the chest revealed a diffuse infiltration of both lungs with a thickened pleura at the right base; a question was raised of a small amount of fluid being present. Temperature ranged between



Penicillin therapy of gonococcic endocarditis of the pulmonary valve.

98 and 101 F. On March 31, ten days after admission, the hemoglobin had fallen to 5.5 Gm. per hundred cubic centimeters; the erythrocyte count was 2,100,000 and the leukocyte count 21,400, per cubic millimeter, with 86 per cent polymorphonuclear cells. The icterus index was 23 units.

On April 1st, eleven days after admission, the patient had a chill and subsequently a temperature of 105.8 F. She was short of breath and complained of moderately severe pleural pain in the right side of the chest. There was a prominent systolic murmur heard to the left of the sternum in the second interspace, which did not radiate. This was accompanied by an unmistakable systolic thrill in the same area. The signs over the pulmonary field were those of flatness, diminished breath sounds and diminished voice sounds over the right base posteriorly and in the axilla consistent with a pleural effusion. The diagnosis suggested was that of an acute endocarditis of the pulmonary valve due to the gonococcus, with associated pulmonary infarction. Blood cultures taken daily from April 1 to 17 inclusive, were reported sterile. Transfusions of 500 cc. of citrated blood were given daily from April 2 to 5 inclusive. A roentgenogram of the chest on April 3 disclosed a diffuse infiltration of the lower half of the right lung. Examination of a sample of sputum revealed no pneumococci or acid-fast bacilli. Diagnostic thoracocenteses were performed April 4 and 6, at which times 26 cc. and 100 cc., respectively, of bloody fluid were obtained. Cultures of both these fluids revealed gram-negative diplococci.

Penicillin therapy was resumed on April 6. The patient received 30,000 units of the antibiotic intramuscularly every four hours for three days, after which the interval was decreased to every three hours. This dosage of penicillin was continued until May 17, a total of 9,780,000 units. Penicillin was also instilled in the pleural cavity in doses of 50,000 units daily from April 10 to 14 inclusive, a total of 250,000 units. On April 12, 13 and 14 no fluid was obtained from the pleural cavity. A roentgenogram of the chest on April 13 revealed only a minor degree of thickening of the pleura at the right costophrenic angle; the pulmonary fields were clear, and there was no evidence of fluid. After April 21 the patient was free of symptoms and the temperature failed to rise above 99 F. (rectally). The thrill over the base of the heart had disappeared, and the systolic murmur previously heard was softer and much less pronounced. On May 1 the administration of ferrous sulfate, 30 grains (2 Gm.) daily, was started. No other therapy was given.

The accompanying chart shows the maximum and minimum rectal temperatures. The penicillin dosage and the routes of administration are also summarized.

On June 13, 1945 the patient was discharged from the hospital. While she was hospitalized she had received a total of 10,740,000 units of penicillin intramuscularly and 250,000 units intrapleurally. The hemoglobin level at the time of her discharge was 12 Gm. per hundred cubic centimeters; the erythrocyte count was 3,950,000 and the leukocyte count 14,600, per cubic millimeter, with 71 per cent polymorphonuclear cells. A roentgenogram of the chest on discharge revealed that the heart was of normal size, shape and position and that there was a thickening of the pleura in the right costophrenic angle. The murmur heard to the left of the sternum was soft, faint and not transmitted. At no time during the illness was the spleen palpable or were there peripheral embolic phenomena.

Since discharge the patient has been most cooperative and has reported for reexamination regularly. She has remained free of symptoms and has gained considerable weight. She appears to be a healthy Negro girl at the present time. She is free of symptoms and is regularly employed for light housework. The pulse rate has varied between 80 and 86 per minute. The systolic blood pressure varies between 115 and 125 mm. of mercury, and the diastolic pressure, from 75 to 80 mm. of mercury. A soft, blowing nontransmitted murmur is heard to the left of the sternum in the second intercostal space. Recent studies of the blood reveal a hemoglobin level of 13.0 Gm. per hundred cubic centimeters; the erythrocytes number 4,230,000 and the leukocytes 7,400, per cubic millimeter.

COMMENT

At the time of admission of this patient there were no evidences of endocardial involvement. The period of illness prior to entry had been brief. The clinical picture appeared to be that of a severe gonococcic pelvic inflammation with an associated hepatitis. For many years hepatitis has been observed with severe gonococcic infections. It would seem that during the period of observation the pulmonary valve was involved. The evidence for an acute infective endocarditis in this patient was the appearance of a systolic murmur and a systolic thrill to the left of the sternum in the second interspace. The clinical and roentgenologic evidence of multiple pulmonary infarction confirms this thesis. Indeed, the development of an empyema secondary to pulmonary infarction offered the only means of bacteriologic diagnosis. Blood cultures consistently remained sterile.

It seems reasonable to postulate that this patient had an acute vegetative endocarditis due to the gonococcus which involved the pulmonary valve.

Recovery from acute gonococcic endocarditis is indeed a rarity. Futcher and Scott [2] commented on this in reporting the recovery of 1 of 4 patients treated with a sulfonamide compound. My patient has remained apparently well for over eighteen months after her discharge from the hospital.

2. Futcher, P. H., and Scott, V. C.: Four Cases of Gonococcal Endocarditis Treated with Sulfonamides with Recovery of One, Bull. Johns Hopkins Hosp. **65**: 377, 1939.

SUMMARY

A case of probable acute gonococcic endocarditis of the pulmonary valve was treated with penicillin. Bacteriologic evidence rests with the recovery of a gram-negative diplococcus from empyema fluid. The clinical course of the patient has been uneventful for eighteen months after her discharge from the hospital.

AGGRAVATION OF A GASTRIC ULCER FOLLOWING DORSOLUMBAR SYMPATHECTOMY

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and
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In recent years there has been an increasing interest in the neurogenic factor in the etiology of gastroduodenal ulcer. Abundant clinical and experimental evidence suggests that increased excitability of the parasympathetic nervous system will aggravate the clinical course of the ulcer syndrome. The adverse effects on an ulcer of psychic stimuli, such as worry and anxiety, are well known. Cushing [1] in 1932 demonstrated the frequent occurrence of ulcers and erosions of the gastric mucosa in patients with organic lesions of the midbrain. He also suggested that these lesions were caused by nervous stimuli from the higher brain centers relayed to the stomach through the vagal pathways.

Dragstedt [2] and his associates at the University of Chicago, acting on the concept that the associated gastric hypersecretion and hypermotility are largely neurogenic in origin, have sectioned the vagus nerves in over 90 patients with gastroduodenal ulcer. Although undesirable symptoms were noticed temporarily in a few cases because of gastric retention, in most instances there was prompt and persistent relief of the ulcer distress, prompt healing of the ulcer crater, reduction in the gastric tonus and motility and a definite reduction in the volume and acidity of the gastric secretions. The cases have not been followed for a sufficient period of time to warrant final conclusions, but the results obtained to date have been decidedly impressive.

The effect of the sympathetic nervous system on gastric function and also on the clinical course of peptic ulcer has not been so clearly presented. To a limited extent the sympathetic and parasympathetic systems have a synergistic and antagonistic relationship. In the stomach, however, the effects produced by nervous stimulation are modified considerably by other factors, such as the local automatic tonus of the gastric musculature and the hormonal content of the blood.

It is fairly well proved that sympathetic stimulation will produce decreased tonus and motility of the stomach, spasm of the pylorus and cardia and increased local vasospasm, but the effect of such stimulation on gastric secretions is still uncertain. It is the opinion of Dragstedt [2] that no change would be expected. Kuntz,[3] however, states: "Although interruption of either the vagus or sympathetic nerves supplying the stomach . . . (in most instances) . . . was followed by no marked changes in gastric secretion, the results observed do not warrant the conclusion that gastric secretory activity is not subject to nervous influences. The assumptions, that gastric hyperacidity commonly is associated with parasympathetic hyperirritability, and gastric hypoacidity with sympathetic hyperirritability are supported by ample experimental and clinical data."

Accepting the antagonistic relationship of the two systems, it seems plausible that if vagotomy has a favorable effect in the treatment of ulcer then sympathectomy will have the opposite effect—namely, aggravation of the ulcer. The following case report is of interest because it offers evidence which suggests that this assumption is correct.

REPORT OF A CASE

A man aged 39 was first seen by one of us (A. R. K.) in April 1944. The patient gave a history of severe headaches, vomiting and blurring of vision for two to three months. He also gave a history of mild epigastric distress off and on for one or two years. The epigastric distress was relieved by the ingestion of milk and bicarbonate of soda. His past history was noncontributory except for an appendectomy in 1922, a tonsillectomy in 1919 and the usual childhood diseases.

Examination revealed a well developed, well nourished man aged 39, weighing 135 pounds (61 Kg.). His blood pressure was 250 systolic and 130 distolic. Examination of the eye grounds revealed hemorrhages and exudate 3 plus, edema of the optic disks and vascular sclerosis. Examination of the lungs, heart, thyroid and abdomen revealed that all were essentially normal. There was moderate peripheral vascular sclerosis. Urinalysis revealed specific gravity 1.015, p_H 6, a trace of albumin, 20 to 30 red blood cells and 20 to 30 white blood cells. The blood urea was 72.7 mg. per hundred cubic centimeters, the red blood cell count was 4,460,000, the hemoglobin 13.9 Gm. and the white blood count 10,150, with 87 per cent polymorphonuclear leukocytes. A roentgen examination of the chest and heart revealed essentially normal conditions. Fluoroscopic examination of the stomach revealed a small prepyloric gastric ulcer. Gastric analysis unfortunately was not performed.

The diagnosis of malignant hypertension was made, and the patient was referred to Dr. Paul Flothow,[4] neurosurgeon, for sympathectomy. In April 1944 an extensive Smithwick type of operation was performed, removing the splanchnic nerves from the seventh dorsal to the second lumbar vertebra inclusive. The symptoms of hypertension improved remarkably after operation. The blood pressure dropped to 140 systolic and 90 diastolic, and it has remained there since. The changes in the eye grounds improved, as did the blurring of vision and the headaches. While convalescing from the surgical intervention the patient had a severe gastrointestinal hemorrhage, vomiting fresh blood and passing blood by rectum. The bleeding was controlled by a medical regimen. In spite of the repeated hemorrhages, the patient had practically no pain due to the ulcer, but he did complain of intermittent eructation. One month later, in June, he had a second severe hemorrhage, and again in July, a third. Gastric analysis two months after the sympathectomy revealed a free hydrochloric acid of 64 degrees and a total acid of 75 degrees. Roentgen examination at that time showed a deep ulcer crater on the lesser curvature of the stomach in the prepyloric area and considerable pylorospasm.

Finally, in September, a radical subtotal gastric resection was performed by one of us (H. M. B.), removing four-fifths of the stomach. Gastrointestinal continuity was restored by a posterior, short loop, Hoffmeister anastomosis. Pathologic examination of the stomach revealed a large prepyloric gastric ulcer on the lesser curvature and also an old, healed scarred ulcer in the first portion of the duodenum. There was no evidence of malignant growth.

The convalescence was uneventful. The patient gained weight. He was relieved of his gastric complaints, and for the past year he has been in good health. His blood pressure has ranged between 140 to 160 systolic over 90 to 100 diastolic. Three gastric analyses have been made since the operation, and these all reveal no free hydrochloric acid, even after stimulation with histamine. Roentgen examination shows only a small portion of stomach remaining with a good functioning anastomosis.

It is unfortunate that we do not have in this case adequate studies on the gastric secretions, but when the patient was first seen the symptoms of hypertension so overshadowed the symptoms of ulcer that studies of the gastric secretions were not performed. However, after the sympathectomy there was a decided elevation in free hydrochloric acid.

From the Western Montana Clinic

1. Cushing, cited by Kuntz.[3]
2. Dragstedt, L. R.: Section of the Vagus Nerves to the Stomach in the Treatment of Peptic Ulcer, Surg., Gynec. & Obst. **83**: 547-549 (Oct.) 1946.
3. Kuntz, A.: Autonomic Nervous System, ed. 3, Philadelphia, Lea & Febiger, 1945, pp. 240-241.
4. Flothow, P.: Personal communication to the authors.

A similar case is reported by Weeks, Ryan and Van Hoy[5] in a recent issue of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

A man aged 47 had a duodenal ulcer plus malignant hypertension. A complete transthoracic vagotomy was performed, and at the same time the left thoracolumbar sympathetic chain was removed from the fifth dorsal to the second lumbar vertebra. Subsequent to this the patient did well. His ulcer symptoms were greatly relieved, although he was troubled somewhat on the fifth and sixth postoperative day with mild gastric dilatation. This was relieved by intragastric suction. The second stage sympathectomy was performed two weeks later, removing the right thoracolumbar sympathetic chain, also from the fifth dorsal to the second lumbar vertebra. After the second operation the patient became extremely ill and finally died on the fifteenth postoperative day. Autopsy revealed a perforated duodenal ulcer with general peritonitis. An interesting feature in this case is the absence of abdominal pain in the presence of a perforated ulcer with peritonitis. The authors state: "The patient's failure to have acute pain ordinarily associated with a perforating ulcer may have been due to the removal of the viscerosensory fibers associated with the sympathetic side of the autonomic nervous system."

COMMENT

These 2 cases offer convincing evidence that extensive resection of the sympathetic nerve supply to the stomach will have a harmful effect on the clinical course of gastroduodenal ulcer. In both cases the sympathetic resection was performed for malignant hypertension, and it is significant that in both cases the resection was extensive, extending from the fifth and seventh dorsal to the second lumbar vertebra. Our patient with a gastric ulcer had three massive hemorrhages shortly after sympathectomy but finally recovered after a subtotal gastric resection. The patient whose case is reported by Weeks, Ryan, and Van Hoy[5] had a duodenal ulcer which perforated, causing death from peritonitis on the fifteenth postoperative day. It is of interest that the sympathectomy relieved the ulcer pain in both these cases, even though the pathologic process continued. This confirms the view that sensations of pain produced by ulcer are transmitted through the sympathetic nerves.

In reviewing these 2 cases we are aware that in 1942 Froehlich, Stephan and Froehlich[6] reported 4 cases of gastric ulcer in which sympathectomy was performed (splanchnic resection with removal of the first two lumbar ganglions). In all of them the distress was relieved and the ulcer crater showed radiographic evidence of healing.

In 1945, however, Sicard, Albot and Tricard[7] reported 8 cases of gastroduodenal ulcer which contradict these observations. Five of these were submitted to bilateral and three to unilateral splanchnicectomy. The first two lumbar ganglions were removed in 2 cases. Although there was some relief of ulcer pain and distress within the first few months, there was no demonstrable change in the appearance of the ulcer crater and there was not a single durable cure. Five were submitted to gastric resection within eighteen months after operation.

In consideration of these observations it is reasonable to assume that the improvement noticed in the 4 cases reported by Froehlich, Stephan, and Froehlich was probably coincidental and not directly related to the sympathetic resection. It is significant that in these cases the resection was incomplete. Hartzell[8] in 1929 demonstrated that vagotomy is ineffective unless all the vagal fibers are divided, and it is probable that the same holds true for the sympathetic nervous system. The relief of pain and distress may be explained by the fact that the nervous fibers conducting the ulcer pain sensations have been sectioned.

5. Weeks, C.; Ryan, B. U., and Van Hoy, J. M.: Two Deaths Associated with Supradiaphragmatic Vagotomy, J. A. M. A. **132**: 988-990 (Dec. 21) 1946.

6. Froehlich, F.; Stephan, F., and Froehlich, C.: Attempts at Treatment of Gastric Ulcer by Splanchnicectomy, Presse méd. **50**: 665-666 (Oct. 24) 1942.

7. Sicard, H.; Albot, G., and Tricard: Splanchnicectomy for Gastroduodenal Ulcers: Results in Eight Cases, Mem Acad. de chir. **71**: 164-166 (March 14-April 25) 1945.

8. Hartzell, cited by Kuntz.[9]

THE SUCCESSFUL TREATMENT OF ACUTE RENAL FAILURE BY PERITONEAL IRRIGATION

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Acute renal failure in which irreversible changes have not occurred in the kidneys is not an uncommon condition, and the mortality in such cases is tragically high because of the accumulation of substances which are normally excreted by the kidneys. A considerable reduction in this mortality may be expected by an artificial means of removing these substances, thereby prolonging life while the kidneys recover sufficiently to resume function. Such an artificial method is applicable to numerous conditions which cause acute renal failure: transfusion reaction, toxicity to sulfonamide compounds, poisoning with heavy metals, toxemia of pregnancy and severe trauma.

The idea of artificial removal of the substances ordinarily excreted by the kidneys is not new. Abel, Rowntree and Turner[1] in 1914 demonstrated a method of dialyzing these substances from the circulating blood of living animals by a system of celloidin tubes interposed in the vascular system. Putnam[2] in 1923 showed the effectiveness of the peritoneum as a dialyzing membrane.

These methods have received new attention in the past several years at the hands of two groups of investigators. Kolf and Berk[3] of Amsterdam, Holland, have developed further the artificial kidney, which consists of a cellophane tube immersed in a solution of 0.6 per cent sodium chloride, 0.2 per cent sodium bicarbonate, 0.04 per cent potassium chloride and 2 per cent dextrose. The circulating blood is passed through this apparatus from a cannula in the radial artery and back into the body by a cannula in a vein of the foot or forearm.

Seligman, Frank and Fine[4] of Boston have utilized the peritoneum as a dialyzing area, using a modification of Tyrode's solution. They performed valuable experimental work and reported successful results of peritoneal irrigation in the case of a patient with uremia due to parenchymatous damage of the kidney by sulfathiazole. They have also reported the treatment of 2 patients for transfusion reaction and of 1 patient for uremia due to urinary obstruction.

The management of the case reported herein was based on the work of Seligman and associates,[4] who applied peritoneal irrigation to a patient with uremia due to transfusion reaction. No originality is claimed by us. This case is reported as an addition to the series already in the literature, in the hope that it may make a small contribution to the development and perfection of a lifesaving procedure. It is believed that the present report is the first for successful management of acute renal failure due to transfusion reaction in a solitary kidney.

TECHNIC

The procedure as described by Frank, Seligman and Fine[5] was followed in general, but certain modifications were necessitated by the facilities at hand.

The modified Tyrode's solution was prepared first, in readiness for irrigation as soon as the tubes were inserted. The constituents of the solution, per liter, are as follows: sodium chloride 8.0 Gm., potassium chloride 0.2 Gm., calcium chloride 0.1 Gm., magnesium chloride 0.1 Gm., sodium biphosphate 0.05 Gm., sodium bicarbonate 1.0 Gm., dextrose 1.5 Gm., sulfa-

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1. Abel, J. J.; Rowntree, W. G., and Turner, B. B.: On the Removal of Diffusible Substances from the Circulating Blood of Living Animals by Dialysis, J. Pharmacol. & Exper. Therap. **5**: 275, 1914.

2. Putnam, T. J.: The Living Peritoneum as a Dialyzing Membrane, Am. J. Physiol. **65**: 548, 1923.

3. Kolf, W. J., and Berk, H. T. J.: The Artificial Kidney: A Dialyzer with a Great Area, Acta med. Scandinav. **117**: 121, 1944.

4. Seligman, A. M.; Frank, H. A., and Fine, J.: Treatment of Experimental Uremia by Means of Peritoneal Irrigation, J. Clin. Investigation **25**: 211, 1946.

5. Frank, H. A.; Seligman, A. M., and Fine, J.: The Successful Treatment of Uremia Following Acute Renal Failure by Peritoneal Irrigation, J. A. M. A. **130**: 703 (March 16) 1946.

diazine sodium 0.1 Gm., heparin 0.5 mg. and penicillin 5,000 units. The solution was made up in 1 liter infusion flasks and was autoclaved, except that the sodium bicarbonate, sulfadiazine sodium, heparin and penicillin were withheld and added to each flask as it was used. It was feared that the latter constituents would not stand autoclaving, especially the sodium bicarbonate, which would decompose with the formation of toxic substances. The sulfadiazine and penicillin were included to combat infection, and heparin was added to prevent fibrin formation and adhesions. The insertion of the peritoneal tubes was a relatively simple procedure performed under local anesthesia, using two 30 F. mushroom catheters. The recommended flank position was impossible on the right because of the lumbar nephrectomy incision, so the right tube was placed through a high McBurney incision near the iliac crest. The left tube was inserted through the flank. The peritoneum was closed snugly around the catheters, the incisions were closed in layers with catgut, and the skin was closed with black silk. Both catheters were anchored to the skin with silk sutures.

The irrigating solution was attached to the right catheter, using a drip method by which the rate could be measured and controlled. A bacterial filter, though desirable, was not available. The arrangement was such that it was necessary only to handle the infusion flask and not to tamper with the connection of the tubing and catheter.

The left catheter was connected to a constant suction apparatus in the wall. Interposed in this system was a sterile 1 gallon (4.4 liter) bottle as a trap to catch the fluid. There was also a small, guarded air vent to prevent too forceful suction against any portion of the intestine.

The proposed irrigation rate of 1,000 to 1,500 cc. per hour could not be achieved. Inflow was easily possible at that rate, but not the outflow, which attained only about 500 cc. per hour. After great distention of the peritoneal cavity, the inflow had to be retarded to correspond to the overflow. The average irrigation was 500 cc. per hour for two days and 300 cc. per hour for the latter two days. The recovered washings were carefully saved for analysis.

Removal of the tubes was accomplished under light anesthesia with pentothal sodium.

REPORT OF A CASE

Mrs. M. E. K., a white woman aged 35, was admitted to the urological service, Grady Memorial Hospital, Atlanta, Ga., on June 12, 1946. Three weeks previously she had consulted her physician for pain in the right side of her abdomen and in her right flank, without urinary symptoms. He found a large mass in the right upper quadrant of her abdomen, and an excretory urogram revealed a large solitary calculus in the upper pole of an exceedingly large right kidney. She was subsequently admitted to this hospital.

Physical examination showed her to be in satisfactory general condition. The presence of a mass occupying the whole right hypochondrium and extending to a level 3 to 4 cm. below the umbilicus was confirmed. Her general appearance was that of chronic illness with some loss of weight.

Urologic examination revealed a poorly functioning right kidney with thick, purulent, offensive urine from it. The left kidney excreted normal urine and had good function. Retrograde pyelography indicated that the left kidney was anatomically normal but that the right was enlarged in all dimensions. There was pronounced intrarenal hydronephrosis, with an irregular calculus measuring 4 by 5 cm. occupying the upper calyx.

Laboratory studies were as follows: Catheterized bladder urine was normal except for innumerable pus cells and a strongly positive test for albumin. The examination of the blood showed mild anemia with a red blood cell count of 3.6 million and hemoglobin of 9.2 Gm. per hundred cubic centimeters. The white blood cell count was 6,000. The nonprotein nitrogen was 38 mg. per hundred cubic centimeters. The blood calcium and phosphorus determinations were normal on three successive days. Her blood type was 4 (O), Rh positive.

On the basis of these examinations, a right nephrectomy was performed on June 15, 1946, using cyclopropane anesthesia. Considerable difficulty was encountered in freeing the organ from surrounding structures, and severe bleeding ensued. In spite of transfusions of whole blood and plasma the patient suffered profound shock during the latter half of the operation. In the course of the procedure she received 1,500 cc. of type 4 (O) blood, Rh positive, and 600 cc. of blood plasma. For several hours after the operation the patient remained in mild shock, but her blood pressure returned to its original level within twenty-four hours, during which period she had been given another 500 cc. transfusion of whole blood, type 4 (O), Rh positive, and 500 cc. of blood plasma.

Decided oliguria was observed during the postoperative period. The output was 175 cc., 135 cc. and 20 cc. for the next three days, and these specimens contained both red cells and hemolyzed blood. A diagnosis of transfusion reaction, hemolytic type, was made. Severe involvement of the single left kidney was indicated by suppression of urine and rapidly increasing azotemia. The nonprotein nitrogen was 69 mg. per hundred cubic centimeters on the second day and 86 mg. on the third day postoperatively. The blood count was maintained at its original level by the transfusions, but the patient became stuporous with uremia. Infusions of isotonic solution of three chlorides and alkalinization with sodium bicarbonate given

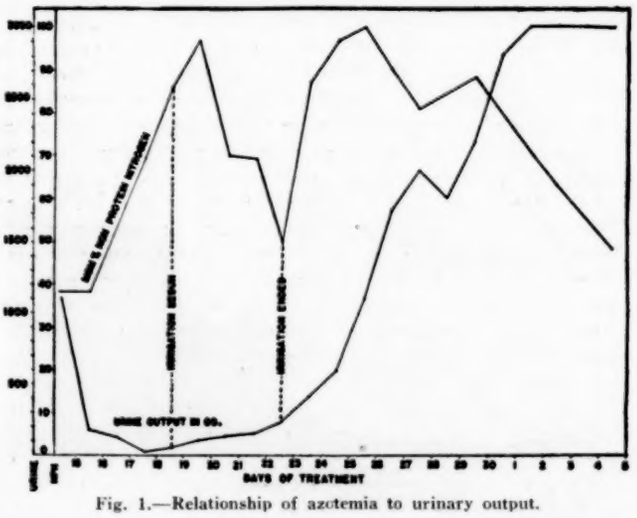

Fig. 1.—Relationship of azotemia to urinary output.

intravenously failed to promote the excretion of urine. Within three days the patient's condition had become critical.

Peritoneal irrigation was instituted on June 18, 1946 about eighty-four hours after nephrectomy. The procedure was initiated under local anesthesia and was well tolerated by the patient. Continuous irrigation was maintained for four days. Penicillin was administered parenterally during this period, and a Levine tube was kept in the stomach with constant Wangensteen suction. Each day 3,000 cc. of fluid was given intravenously in the form of isotonic solution of three chlorides and dextrose.

Beneficial results of this therapy were observed almost immediately. The azotemia receded from 86 to 50 mg. of nonprotein nitrogen per hundred cubic centimeters in four days, and the urinary output, which increased in four days from 20 cc. to 240 cc. per day, was now clear and not bloody. The patient made a remarkable clinical improvement also. She became oriented, alert and optimistic.

The peritoneal irrigation was discontinued on June 22, 1946 after four days of continuous use. The level of nonprotein nitrogen immediately rose again to 100 mg. per hundred cubic centimeters within three days, but the urinary output increased each day, up to 2,800 cc. on the twelfth day, by which time the nonprotein nitrogen had receded to 62 mg. per hundred cubic centimeters. By now the patient had made a striking recovery and was eating well and sitting up.

Examination of the recovered peritoneal washings on the second day showed that the urea content was 47 mg. per

hundred cubic centimeters, and on the fourth day it was 53 mg. The urine which began to be excreted after resumption of renal function had a urea nitrogen level of 100 to 140 mg. per hundred cubic centimeters, and the specific gravity remained at 1.010 to 1.012. The day to day relationships of the nonprotein nitrogen level, the urinary output and the urea clearance through peritoneal washings are graphically presented in charts 1 and 2.

When the peritoneal tubes were removed, they were seen to be covered with an exudate, but the patient never showed clinical evidence of peritonitis. She had pronounced distention, but peristalsis was always heard. She was taking fluids by mouth throughout the illness, though for ten days there was suction applied to the stomach tube. Her temperature never showed a septic rise, but stayed below 100 F. A blood sulfadiazine level of 5 mg. per hundred cubic centimeters was reached by absorption from the peritoneal irrigation.

In the period of urinary suppression, progressive edema of the legs and trunk was noted and became well defined. There was moderate pulmonary edema with embarrassment of respiration, but this never appeared critical. Also during the height of azotemia there was acidosis, as manifested by a carbon dioxide combining power of 39 volumes per cent. Intravenous fluids were restricted to combat the edema, and sodium bicarbonate and 10 per cent dextrose were given for correction of the acidosis. Both the edema and the acidosis subsided satisfactorily after the resumption of renal function.

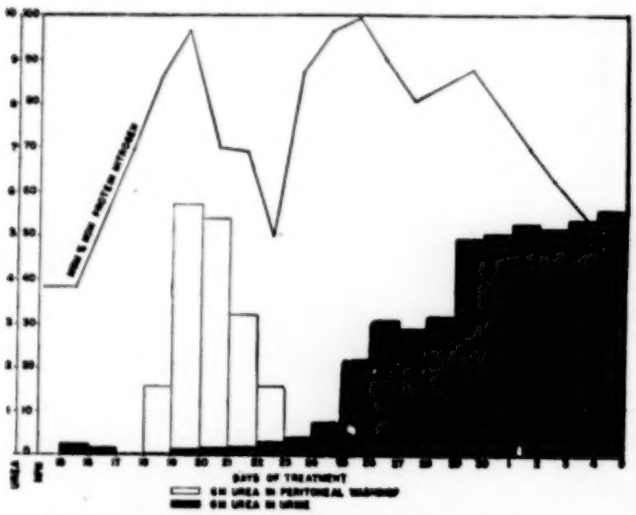

Fig. 2.—Relationship of azotemia to actual urea content of peritoneal washings and urine.

Within three weeks from the original operation, the patient was out of bed and beginning to walk again. Urinary excretion continued to be satisfactory after its commencement. On July 5, 1946 the level of nonprotein nitrogen was 48 mg. per hundred cubic centimeters and the phenolsulfonphthalein sodium excretion was 30 per cent in two hours. The edema had almost disappeared.

On July 12, 1946, one month after admission, the patient was discharged from the hospital. She has been followed for four months since that time and is doing well. She is gaining weight, feeling well and doing her housework. There is some residual impairment of renal function, as manifested by fixation of the specific gravity of her urine at 1.010 to 1.012 and by the phenolsulfonphthalein excretion of 40 per cent in two hours.

COMMENT

Peritoneal irrigation is a formidable procedure and not to be undertaken lightly, mainly on account of the risk of peritonitis. The decision to initiate this procedure was reached in this case because it appeared that the patient was going to die, which justified any lifesaving effort.

We cannot state definitely that the patient would have died or that she was saved by the procedure, but the results were decidedly striking. The azotemia began an immediate recession and the formation of urine was resumed. When the irrigation was suspended the azotemia quickly took an upward turn, which gradually decreased as the output of urine increased. The patient's recovery was the remarkable feature, since she had been expected to die, and this recovery appeared to be directly related to the irrigation.

The actual amount of urea recovered in the washings was small in comparison with that reported to have been recovered by others. The patient was a small woman; she received little protein in the three preoperative days and was receiving no protein during the peritoneal irrigation. The amount of urea removed was enough to reduce the nonprotein nitrogen level, and chart 2 shows that it was as high as the amount in the urine two weeks later, when renal function alone had reduced the nonprotein nitrogen level to 48 mg. per hundred cubic centimeters. This demonstrates that it was a significant amount.

The greatest problem technically in our experience was the outflow of the peritoneal irrigation. It constantly required attention and manipulation and never allowed the desired irrigation rate of 1,000 to 1,500 cc. per hour. Fine, Frank and Seligman[6] used a stainless steel suction tube with numerous perforations, which was placed through the flank and well down into the pelvis. This should be much more effective than the simple mushroom catheter.

The inflow never caused any difficulty. It had to be retarded to correspond to the outflow, so as not to overdistend the peritoneal cavity. A bacterial filter should be used in the inflow apparatus.

For the sake of others who might undertake the procedure for the first time, it should be emphasized that it is complicated and tedious. It requires full time special nursing and a great deal of time and attention on the part of the physician. Adequate laboratory facilities are almost indispensable.

Fluid balance and acid-base balance are probably as important as the reduction of the azotemia. Excess intravenous fluid produces edema, which may be disastrous in the lungs or brain. Acidosis is always present, and requires the administration of dextrose and alkali compounds. Electrolyte studies of the plasma were not made in this case, but they should be done with a view toward variation of the irrigating fluid to maintain the electrolyte balance.

SUMMARY

1. Peritoneal irrigation is confirmed as an effective method of treating uremia.

2. It has been successfully used in a case of acute renal failure due to transfusion reaction in a solitary kidney.

6. Fine, J.; Frank, H. A., and Seligman, A. M.: The Treatment of Acute Renal Failure by Peritoneal Irrigation, Ann. Surg. **124**: 857, 1946.

A Welter of Material Aids.—The impact of modern civilization and scientific progress has engulfed the physician in a welter of material aids, a maze of imposing buildings and a host of essential personnel that would bewilder a less intrepid soul. He must whet his education on the grindstone of endless mechanisms while balancing his diagnostic and therapeutic skills with the verdict of the laboratory or the latest gadget he must employ to keep up with the times. Liberated at last from empiricism, he must today chart a course between the auxiliary medical service he does not perform and fragmentation by specialization. In the modern practice of medicine, physicians shrink relatively in numbers within the rapidly expanding structure of his workaday world. Already surrounded, how long before he will be submerged by this intricate framework of innumerable ancillary and elaborately staffed, essential services? Superimpose government control, so imminently threatened, on this and the relation of the physician to the whole structure of medicine declines alarmingly in importance. Weaken the keystone of the arch and the entire structure is imperiled. Reduce the practitioner of medicine from his high estate of servant of the public and devotee of culture to the role of slave to government and the top-heavy superstructure cracks, topples, then comes crashing down on that public with devastating effect.—Abridged from the *Journal of the Florida Medical Association*, March 1947.

Council on Physical Medicine

The following article has been adopted by the Council on Physical Medicine:

The Council wishes to express its appreciation for the valuable cooperation of the Consultants on Ophthalmic Devices in reviewing this article. The consultants are Drs. Walter B. Lancaster, chairman; Thomas D. Allen, S. Judd Beach, Conrad Berens, Frederick C. Cordes, Alfred Cowan, William H. Luedde, Lawrence T. Post, Avery D. Prangen and Kenneth C. Swan. This paper was also submitted to the American Orthoptic Council and embodies the criticisms and suggestions of that council.

HOWARD A. CARTER, *Secretary.*

ORTHOPTICS

(Second Paper)

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Orthoptics deals with binocular vision. The orthoptic technician has to deal with the stumbling blocks to binocular vision which must be overcome in order to establish normal binocular vision. What are the obstacles to be overcome? Or, to put the same question in another way, what are the causes of orthoptic failure?

One can list the obstacles to normal binocular vision by determining to which of four main classes the patient belongs: 1. Is it possible for the patient to straighten his eyes or are there insuperable obstacles to binocular vision? 2. Can he learn to know what his eyes are doing? Can he recognize his errors in fusion? 3. Can he be comfortable fusing habitually? 4. Does he desire to use his eyes correctly? These will be amplified and explained, and then the three ways in which these problems can be attacked by the orthoptic technician will be enumerated and developed.

1. Is it possible for the patient to straighten his eyes—has he got it in him to straighten his eyes? If not, then his is not a case for orthoptics. Orthoptics deals only with cases in which there is no insurmountable obstacle.

It is not possible to tell by inspection whether the patient can or cannot straighten his eyes. The mere size of the deviation is surely not enough to warrant the assertion that he cannot, after suitable training, straighten his eyes; but it is often possible to say that if first he has some surgical intervention performed to reduce the deviation (*a*) he will be much better able to straighten them and (*b*) it will take less time to straighten them. This applies to certain types of deviation much more than it does to others.

Note that the reason why this patient will not be able to straighten his eyes is not for the orthoptic technician to give, although often her opinion may be extremely valuable to the ophthalmologist. But, essentially, the problem is up to the ophthalmologist. He may find congenital anatomic defects that preclude normal binocular vision as a habit: (*a*) Some of these are visual defects. A visual acuity below 6/20 does not make binocular vision with fusion and depth perception impossible of attainment on the major amblyoscope, but it makes the use of binocular vision in casual seeing as a habit decidedly improbable. (*b*) Some are orbital defects. (*c*) Some of the defects in the neuromuscular system are above the orbital and muscular level inside the cranium, perhaps nuclear or supranuclear. These are the defects that are difficult to find without prolonged work on the patient. Certain forms of paralysis are temporary and the patient recovers in a few months, leaving deviations which can be helped by orthoptics; but most paralyses belong in the class of insurmountable obstacles to binocular vision as far as orthoptics is concerned. Neither the orthoptist nor the ophthalmologist can always tell by inspection (i. e., by one or two careful and thorough examinations) whether or not there are insurmountable obstacles.

This is illustrated by the case of a young girl who had had five surgical operations and whose muscles were pronounced by the surgeon too attenuated for further surgical intervention until she was perhaps five years older. The technician found an esotropia of 20$^{\Delta}$; after long treatment she was able to teach the patient to fuse and to read binocularly. At the time of reporting, the patient did not habitually fuse for distance yet her deviation was reduced to 10$^{\Delta}$ and with prisms base out she was well on the road to binocular vision. The ophthalmologist had definitely pronounced the case incurable.

Thus it is often impossible for surgeon or orthoptic technician to decide at once whether the case is one in which the patient cannot straighten his eyes after suitable treatment. And the inference is justified that as knowledge and skill increase the number of patients in this group will diminish.

2. Can he learn to recognize his errors of fusion? In order to correct them he must be aware of what he is to correct. This is the first step in orthoptic training in many cases. The patient must be taught to recognize diplopia. There are several tools or methods of dealing with it which will be taken up later. The important point now is to understand what is meant by the question: Can he learn to know what his eyes are doing? For example, when the eyes cross, diplopia should result; it does result in normal persons. Can this patient learn to see double? That is the first step in the process of teaching him to fuse and see single binocularly instead of seeing single by suppression, as is his habit.

3. Can he be comfortable fusing habitually? A patient may be trained to fuse on the synoptophore, but if he is to maintain fusion in casual seeing as a habit he must have the reflex of fusion reinforced by the satisfaction of comfort. He has been squinting and suppressing because it was the most comfortable way of seeing. It is not to be expected that he will adopt the new way of binocular single vision unless it is made a comfortable way.

This applies to patients with phorias in particular, since they do fuse, but the patients sent to the orthoptist complain of more or less severe discomfort due to

This paper was written in response to a request from the Council on Physical Medicine for a second paper amplifying the original paper, "What is Orthoptics?" which was published Feb. 16, 1946, by giving in more detail an account of the actual work performed by an orthoptic technician. This is not an attempt to cover the whole field of orthoptics but an attempt to give as accurate and definite an outline as possible of some of the most important things an orthoptic technician has to do in her daily work, about which most medical practitioners have imperfect and inaccurate information. It is not to be expected that all will agree as to what functions to emphasize. We have presented those which we consider the most important.

the effort of maintaining fusion. Unless this can be overcome the case will have to be listed as a failure for orthoptics.

4. Does the patient desire to use his eyes correctly? This is a matter of motivation. Since taking a course of orthoptics, which often involves tedious work at home as well as frequent visits to the orthoptist, may be more of a task than the patient and his parents are willing to go through with, it is one of the stumbling blocks to success.

When the orthoptist receives a new patient the first important step is to classify the case to determine what problems are to be treated—in short, to make a diagnosis. But note that the important part of the diagnosis from an orthoptic point of view is what may be called the functional diagnosis rather than the anatomic diagnosis, which often is the chief interest of the ophthalmologist.

There are four ways of using the two eyes together: (1) normal binocular vision; (2) binocular vision with diplopia; (3) suppression, and (4) anomalous correspondence.

The first step is to ascertain the group in which to place a particular patient, since the treatment differs for the different groups. For example: A patient comes in with convergent strabismus. It is apparent that he is fixing habitually with his right eye and suppressing his left. The first orthoptic step is to deal with the suppression.

Of course, the ophthalmologist has not only previously examined the patient but prescribed glasses if needed and carried on treatment for amblyopia by occlusion until the vision has improved to the point where binocular vision is possible. Some ophthalmologists prefer to have the orthoptic technician take charge of the occlusion treatment, since it often requires attention to various details besides the occlusion, such as stimulating the use of the eye which is the laggard by various devices, such as pictures, movies and the like. Occlusion is of the greatest importance in two ways. First, by covering the good eye it compels the use of the amblyopic eye, thus causing the sight to develop in the poor eye, which otherwise would become permanently nearly blind—amblyopic. Occlusion is effective before 6 or 7 years of age during the years when the eyesight is developing. If treatment is postponed or neglected during this critical period, it becomes too late and treatment is usually of no avail. Esotropia can be corrected by operation at any time—even after 70 years of age, but if amblyopia is neglected sight may be gone forever.

In the second place occlusion is often necessary to prevent faulty use of the two eyes together, particularly in anomalous correspondence. While the patient is undergoing treatment by the orthoptic technician, who is aiding in the development of correct habits of binocular vision, it is important not to permit habitual faulty use of the eyes at home. Hence, occlusion of one eye is essential as a means of preventing the bad habits from becoming more and more deeply ingrained. To be most effective occlusion must be continuous, not merely for a few hours a day. After the vision has been brought up to about normal for the age and existing ocular conditions, it can be maintained by practicing occlusion a few hours a day.

There are several ways of carrying out occlusion. 1. The eye can be covered by a patch fastened with strips of adhesive or of Scotch tape. 2. The spectacle lens of that eye can be (*a*) opaque or (*b*) made blurry by rubbing soap on the surface or by stippling with varnish (fingernail varnish, for example) or by having the surface etched with acid. In these cases it is often desirable to prevent looking around the lenses by using leather or plastic fitted to shut off the peripheral vision, as some goggles do. 3. Atropine can be instilled in the eye, thus making distant vision somewhat blurry and near vision very blurry. The family physician should appreciate the importance of occlusion and use his influence to aid in enforcing it.

The same problem of suppression is found in a patient with exophoria, who often suppresses one eye as a way of escape from the great effort he must make to obtain binocular vision. Elimination of suppression is the first step toward relief. Similarly with an alternating strabismus. In fact there is nothing in the field of orthoptics so common and so important as suppression.

4. Anomalous correspondence is one of the common causes of trouble, and the orthoptic technician has to discover and attack this problem.

When one eye is fixating an object and the other eye is not doing so but is deviating, it sees the fixated object out of the corner of that eye and suppresses the image of whatever object is imaged on its fovea. If this occurs and is kept up during the years when binocular vision would normally be developed (before 6 years of age) it not only prevents normal binocular sensory relations from developing but it gives rise to an abnormal (anomalous) sensory relationship between the two eyes. Certain points of the two eyes which normally correspond (i. e., have the same directional value or see things in the same direction) no longer function that way; and when the new abnormal relationship is firmly established it is called anomalous correspondence. At times this is easy to correct, but more frequently its correction is difficult and sometimes even impossible. Thus it is one of the important stumbling blocks to orthoptic success.

What are the tools or measures available to the technician in dealing with the problem which she has found? The problems may be grouped under (*a*) suppression problems, (*b*) vergence problems and (*c*) problems of anomalous correspondence.

SUPPRESSION

The problem in suppression is to teach the patient to perceive—to become aware of—the image on the retina of the suppressing eye. The image is formed on the retina and the stimulus of the image gives rise to the sensation, but the sensation is suppressed and kept from reaching consciousness. With the major amblyoscope it is possible to present images and by suitable rotation of the arms of the amblyoscope to move the images on to the foveas of the two eyes. The patient may be able to see either one when the other is excluded, but when both are presented he probably will suppress one. The orthoptist must teach him to take notice of both. This may take many lessons or it may succeed almost immediately.

Suppression is a normal every day function of the central nervous system. In dealing with his problem of difficult binocular coordination the patient who solves the problem by suppressing the image seen by one eye is making use of a normal function, one which is extremely important in human behavior. Normal per-

sons use it in dealing with physiologic diplopia which otherwise would be decidedly annoying. A most valuable tool in combating suppression is the arousing of awareness of physiologic diplopia, since this is only possible when two eyes are being consciously used. It thus becomes the first step back from abnormal suppression to teach the child to recognize and become aware of physiologic diplopia. It has the further great advantage that it can be practiced at home, and progress can thus be greatly accelerated. A striking object such as a white figure on the end of a stick is given the patient to look at. A red filter (glass, gelatin or plastic) before one eye makes the object red to that eye, while to the bare eye it is white. This makes it easier for him to recognize two objects, since the image is perceived by one eye as red, while the image of the same object is perceived by the other eye as white. There are many details to be observed in carrying out this exercise and in adapting it for use at home. A spot on the wall may be used if it is sufficiently conspicuous.

A second device or tool for combating suppression is bar reading, which has been developed into an effective form of exercise. The patient holds a black bar (a band of black pasteboard 20 mm. wide is suitable) a few inches in front of his nose, and he looks at (fixates) a picture on the wall. He should see two black bars, one on each side of the picture. This may take a little, or a good deal, of teaching before he succeeds. The same arrangement is used in looking at a book with pictures, perhaps of animals, which he can frame with the bar seen as two bars, if he can be made to recognize physiologic diplopia. To do this he must use both eyes. Thus he is learning the first step toward fusion—to stop suppressing and to use both eyes. He must first learn to see double and then learn to overcome the diplopia, not, as is his custom, by abnormal suppression but by fusion. Orthoptic binocular exercise cannot be begun until the patient has learned to fixate with each eye. One of the first exercises is teaching the child to hold fixation to the count of fifty with either eye at command. Children too young for this are too immature for orthoptics.

THE VERGENCES

Usually the most striking thing about a patient who has failed to develop normal binocular vision is the deviation of the eye which is not being used for fixation. It is a conspicuous blemish—a form of cross eyes. When an eye deviates the mechanism which should pull it into the correct position is the vergence reflex. If the eyes are diverging the action needed is more convergence. If they are converging too much, the action needed is more divergence. And if there is a vertical deviation, sursumvergence is needed. The angle between the visual axes is changed producing more convergence or less convergence, i. e., changing the vergence; hence they are called vergences.[1] Since it is the vergence power that corrects deviation it is obvious that orthoptists are much interested in vergences. Vergence problems, in fact, are second only to suppression problems in orthoptics. In dealing with vergence problems two measurements are vital. The first is the deviation, which should be measured, of course, by the ophthalmologist before he sends the patient to the technician. He has several ways of measuring it. The orthoptic technician also measures the deviation (which she calls "the angle"), generally using the major amblyoscope in a form of the cover test. She flashes the light first on one target, then on the other, and observes the movements of redress which the eyes make as each takes on fixation. Meanwhile the technician keeps changing the angle of the arms until no movement of redress is observable.

The second set of measurements includes the amplitudes of fusion. Starting with the arms of the amblyoscope set at "the angle" the patient is given targets which he can fuse (if he is capable of fusion) and one sees how far he can maintain fusion as the arms are slowly made to converge (or diverge) before the images separate and he sees double. Then the arms are moved slowly back until the images are fused again. The first reading is the "break" point, the second is the "recovery" point. Both are significant. The ophthalmologist uses the rotary prism (or prism bar) to measure the amplitudes of prism convergence and prism divergence in such cases. They are recorded as a fraction, the numerator showing the break point and the denominator, the recovery point.

The most important known cause of convergent squint is hypermetropia. It acts through the accommodation. In order to see clearly, the hypermetropic person has to correct his hypermetropia by accommodating (or by glasses); but accommodation is easier if convergence is done at the same time (accommodation convergence reflex, near reflex). Accommodation and convergence and contraction of the pupil constitute the near reflex. Accommodation and convergence are intimately but not inextricably linked together. Increase of accommodation carries with it increase of convergence. Reduce the accommodation and the convergence is reduced. The ophthalmologist takes advantage of this and prescribes convex lenses to reduce the necessity for accommodation and so to reduce the convergence. In a purely accommodative convergent strabismus this will correct the deviation. In any case it will reduce the convergence to the extent that the accommodation is the causative factor.

There are two problems for the technician in dealing with accommodative squints. The first is the correction of the residual convergence, which is not fully corrected by the convex lenses. The second is the interesting task of teaching the patient to keep his eyes straight without glasses. The first step in this latter task is to teach him to maintain fusion at the expense of accommodation, which means at the expense of seeing blurry. It is the accommodation which makes the images clear on the retina. If the accommodation is relaxed then objects become blurry. If the patient says he is seeing blurry, which means relaxing, then his pupils should dilate somewhat, since they are part of the near reflex. This is a valuable check on the reliability of the patient's statements. One may learn this

1. When one eye alone is being considered its movements are adduction, abduction and so forth and are called ductions. Thus the right eye may be able to abduct 40 degrees and the left the same amount, so that the sum of abductions of the two eyes would be 80 degrees of divergence. As a matter of fact the two eyes can diverge in a normal person only 3 to 4 degrees, showing the fundamental difference between abduction and divergence. Unfortunately, the optometrists have adopted the term ductions as including convergence and divergence and vertical divergence movements. Many ophthalmologists have followed their lead and use the term ductions instead of the correct term vergences. Ductions is correct for optometrists—has the sanction of their leaders. Possibly it will be adopted by the next generation of ophthalmologists, many of whom are lax in their use of terms.

relaxation readily, another may not. It is easier if the hypermetropia is not too large, which means that the blur is not so great when the hypermetropia is not corrected by the accommodation. The next and final step is to teach the patient to accommodate without converging. He must learn to dissociate accommodation and convergence. One way is to exercise the eyes on the amblyoscope—the other way is to work on objects in the room. One can start with objects at a distance of 6 meters which require the minimum of accommodation in the room. Then move the object 1 meter nearer. This involves but little more accommodation. Then 2 meters nearer, and so on. The eyes may gain rapidly until the object can be moved to 1 meter from the eyes without losing fusion by excessive convergence induced by the impulse to accommodate in the interest of clear vision, and then when it is moved near enough for reading they may snap into accommodation and so converge and lose fusion. This has to be practiced a long time in some cases, but final success is the rule. A similar innervational task is possible on the amblyoscope by inserting minus lenses, gradually increasing them. They call for accommodation and the arms of the amblyoscope may call for no convergence. Thus the patient gets practice in dissociating accommodation and convergence until he can maintain straight eyes and clear vision at the same time—a perfect cure.

The form of vergence training most widely known is that which aims to increase the amplitude of convergence. The patient is directed to fix a pencil at arm's length and move it in the midline toward the nose until it is seen double because the eyes can no longer converge enough to keep the images on the foveas. The pencil is then moved to arm's length, and the process is repeated. This is done over and over for three to five minutes, several times a day. This is exercising the convergence with the aid of the accommodation, and it is called accommodation convergence. The pencil to nose technic has been amplified as follows (especially in convergence insufficiencies):

1. Move a pencil from arm's length toward the nose until diplopia results.

2. Jump technic: (*a*) Move it a little way toward the nose, close and open the eyes, move a step nearer and close and open the eyes. (*b*) Start at arm's length fusing; close the eyes, move nearer, open and fuse, close the eyes again moving the pencil still more, open and fuse; repeat until fusion fails. By the (*a*) method the patient is fusing while the object is being moved nearer; then the eyes are closed and opened, the patient trying to maintain fusion. By the (*b*) method the eyes are closed while the object is being moved nearer, then opened and fusion held if possible. Method (*b*) is a little more difficult than (*a*).

3. Move the pencil toward the nose until diplopia is reached, then remove the pencil but maintain diplopia of distant objects, i. e., maintain convergence. Care must be taken that the diplopia is homonymous. This can be checked by covering one eye to be sure that the image on the same side as the covered eye is the one that disappears—is homonymous. Or a red filter may be held over one eye to check to see which eye sees the red image; it should be the homonymous eye.

4. Produce voluntary homonymous diplopia at will, on command.

5. Hold the eyes crossed several minutes continuously, perhaps listening to the radio to help pass the time, which seems very long to be holding convergence.

6. Look at a distant object and produce voluntary crossing of the eyes with homonymous diplopia.

One reason the pencil to nose technic is not more effective and does not always produce satisfactory results is because the patient (and the physician, too) does not realize the supreme importance in this exercise of definitely recognizing the diplopia which always occurs when the pencil gets too near for fusion provided that the patient is using both eyes. It is curious how often a patient may go on moving the pencil forward and backward day after day with no improvement. The reason is that he does not attend to and recognize the diplopia. Since he does not notice it he must be suppressing. Since he suppresses he does not use both eyes, therefore he does not improve. Another reason it lacks effectiveness is that what the patient needs is ability to converge without the aid of accommodation, as under heading 6 in the preceding technic. For instance, if the patient has an exophoria for distance, this is overcome by convergence; but if the gaze is fixed on distant objects accommodation is not called for, so he must converge without accommodating. Better results are obtained by exercising the convergence without the accommodation either on the amblyscope by converging the arms or at home by the use of exercise prisms. For example, if the patient has an amplitude of 12/4 diopters of prism convergence, he is given a pair of prisms mounted for convenience in holding them on a spectacle frame without temples.

He may begin with prism 4^{Δ} base out for both eyes, making a total of 8^{Δ}. When this is held before the eyes close to the glasses he is wearing it will make an object across the room appear double, but the fusion stimulus will tend to correct this and make the object appear single by converging the eyes 8^{Δ}. If he cannot fuse an object across the room he must move nearer to it; at a distance of 1 meter he probably will be able to fuse it, aided by winking a few times. Then holding the fusion he walks slowly backward and probably can hold fusion until he moves as far as the room permits. Then the prisms are raised and the object for a fraction of a second is seen double, quickly coming together as he makes the necessary divergence needed to fuse it. Then the prisms are held in front of the eyes again and the process is repeated for three to five minutes, ten times a day or as near ten times as the orthoptist believes the patient is likely to do it with some urging. When the 4^{Δ} prisms are readily overcome the power is increased to 6^{Δ}, then 8^{Δ}, then 10^{Δ}.

This is an exceedingly effective way to improve the convergence amplitude. A similar technic with prisms base in is used for developing divergence amplitudes.

The diplopia technic is also adapted for divergence. The patient fixates a distant object and holds a pencil before the nose. The pencil should be seen double; the diplopia is crossed because the eyes are diverging relative to the distances of the pencil and wall. Then he practices seeing the pencil double at longer distances. A picture may be pasted on the window and seen double when looking at a distant object through the window. Care must be taken that the diplopia is always crossed, which means that the eyes are diverging. When he can back away from the window

across the room and keep crossed diplopia, then he should practice the jump technic, closing and opening the eyes and still maintaining the divergence with crossed diplopia and finally diverging at will on command. These two forms of exercise, the prisms held before the eyes while fixating far and near and the learning of voluntary diplopia, homonymous or crossed according to whether convergence or divergence is wanted, are the effective tools for increasing vergences.

ANOMALOUS CORRESPONDENCE

For the treatment of anomalous correspondence one must have a clear idea of the conditions that exist in a patient with this entity. In the first place he is suppressing the images formed on the fovea of the deviating eye. This suppression must be overcome. He must have perception of the image on this fovea aroused and brought to consciousness.

Second, he has anomalous perceptions of images formed on some extra foveal parts of the retina. These must be suppressed. As a matter of fact they usually are suppressed. It is difficult or impossible to arouse physiologic diplopia in many patients, although this would be possible if they were using an extra foveal retinal area as a so-called "false macula." Sometimes monocular diplopia can be elicited. This occurs when the image on the extra foveal area is not only perceived but it is doubly perceived; i. e., it is seen—perceived—in its proper direction and also seen—perceived—in an anomalous direction. In this case the task is to stimulate and establish the normal perception and erase the anomalous one. In arousing the dormant normal foveal response the fovea must be stimulated in unusual ways in order to be effective. Monocular flashing and massage of the macular area are used, but by far the most effective procedure is locking the arms of the amblyoscope at the true angle so that the images are both on the foveas of the respective eyes and then oscillating the arms vigorously through an angle of 30 to 45 degrees as rapidly as possible, several times a second. Note: The mistake is often made of oscillating through too small an angle.

Many patients will respond in a short time to this. In fact if the patient does not respond in the very first lesson the prognosis is not good—not much can be expected even in fifty or one hundred lessons. This is apt to be the case in an older patient (over the age of 12), for whom it is often the wisest plan (in the present stage of the knowledge of orthoptic technic) to advise surgical cosmetic cure and to abandon binocular vision. The use of occlusion is important in certain cases. When that can be dispensed with, however, treatment can be used which cultivates true diplopia, using great care that the patient is not cultivating the false diplopia which is a fundamental tendency in anomalous correspondence.

SUMMARY

To summarize the task of the orthoptist:

1. Be sure that the patient has sufficiently good vision in each eye. Too great a difference in vision between the two eyes is an insurmountable obstacle to the habitual use of the eyes in normal binocular vision.

2. The patient must learn to fix with either eye at command and hold fixation for the count of fifty. Until he can do this he has not reached the age of readiness. Orthoptic efforts are wasted on a patient who is not yet far enough developed to be able to fix with each eye.

3. In most patients the first step toward binocular vision is learning to overcome suppression. Suppression is the patient's way of escape from the difficulties of binocular vision. To retrace the steps he has taken in the wrong direction away from binocular vision, he must learn to see double—learn physiologic diplopia. This may be easy in some cases but long and arduous in others. The skill of the orthoptist has full play here.

4. The patient must begin to use his two eyes together. One of the devices of great value in learning to use both eyes is bar reading. A simple form of framing pictures with a bar held in the hand can be used before the patient has learned to read. His progress will be much more rapid if he is old enough to have learned to read.

The time element, the age of readiness, is of enormous importance Often a child has been subjected to orthoptic treatment for many months before a certain goal has been reached, and a sober appraisal of the results will show that all the progress has been made in the last few weeks after the patient had attained the degree of development which made him ready for the task. All the time devoted to working at the task before the age of readiness could well be saved by not attempting the impossible. Of course, the difficulty is in knowing when this age has been reached. This is one of the things which future progress in the art will make clearer.

5. Meantime, the patient may have anomalous correspondence. If so, this must be corrected. The danger is great of confirming the bad habit instead of curing it by urging the patient to try binocular vision without carefully controlling the methods he uses. Often occlusion has to be used. In some cases it is not worth while to try to overcome anomalous correspondence.

6. When the patient has learned to use his two eyes separately without suppression it is time to see if he can fuse the two images. There is no way to compel fusion. One can present conditions on the major amblyoscope calling for fusion, two images of the object fairly near together and well adapted for fusing into a single image, then if he can fuse he will. The innate impulse to escape diplopia by fusion is what one has to rely on. If he does not do it the first time he may do it the one hundredth time—one has to persist.

7. Amplitudes of fusion must be developed by vergence exercises, of which there is a variety. The philosophic or theoretic basis of orthoptics consists in setting up a situation and putting the patient in a place where he must respond; making the response satisfying (reinforcing the reflex, writers on conditioned reflexes call it); making unsatisfactory responses unsatisfying to the patient, and repeating the satisfactory response often enough so that it is well established.

With the major amblyoscope, the orthoptic technician has the situation firmly under control. There are no extraneous stimuli entering the situation. The technician can control the lights and movement of the instrument and can control the stimulus by the choice of targets so that the patient is almost forced to make a correct response. Once he makes that response he is praised for it and encouraged to repeat it. Thus the patient learns. This is orthoptics.

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SATURDAY, APRIL 19, 1947

TROPICAL DETERIORATION

Many people who live in moderate climates believe that tropical climate has a baneful influence on white persons. Men of letters (Kipling, Conrad, Maugham) as well as some students of tropical medicine have expressed similar beliefs. Rogers and Megaw list among contributing causes of "tropical neurasthenia" hot climate, especially when monotonously wet and continuous, and depressing environment with absence of congenial society, poor food and deficient or excessive exercise. Reed [1] described one form of tropical neurasthenia in which patients complain of asthenia, anorexia, easy tiring, palpitation, languor, variable abdominal pains, often unexplained nausea, vomiting and diarrhea. The systolic blood pressure is below normal. The early experiences of our armies in the jungles of Malaya, Burma and the Southwest Pacific strengthened the belief in a specific deleterious, harmful effect of tropical climate on white men. With the development, however, of effective methods for control of malaria, dysentery, heat disturbances and other tropical dangers by the use of new drugs, new methods of controlling insects and infectious diseases, scientifically tested tropical clothing and adequate amounts of water, salt and food, most of the hazards of fighting in the tropics were successfully combated.

Surveys on the health of troops in the tropics made in 1945 by two separate teams [2] throw an interesting light on the importance of nutrition in combating tropical deterioration. The Canadian unit operated in India and Burma, where it studied Indian soldiers exclusively. The United States unit operated in the Central, South, Southwest and Western Pacific, where it studied United States troops, both white and colored. Both teams collected systematic information on feeding policies and practices, on the diet of individual soldiers and groups of soldiers, on health as determined by medical histories and physical examinations, and on physical fitness. Samples of the urine and blood of each person were analyzed in specially constructed field laboratories. The results of these surveys were interpreted by comparing them with data collected in two large scale ration trials conducted under rigidly controlled field conditions during 1944 in North America. The observations in the ration trials were made by the same methods used in these surveys, and 2 members of each survey team had participated in both North American trials. The average nutrient intake was of the same order of magnitude as that for garrison troops in the Pacific and United States troops in training camps in the United States. Scores in tests of physical fitness were at a high level in troops who had recently survived in combat and were less good in rear areas. Distribution curves for the data on hemoglobin, plasma protein, urinary chloride, urinary ascorbic acid, urinary thiamine and urinary riboflavin were similar for United States troops in the Pacific and United States and Canadian infantry in North America. On the basis of clinical findings and biochemistry, cases of classic nutritional deficiency syndromes were not seen. Skin diseases, especially heat rash and epidermophytosis, were common, more so in forward than in rear areas. Moderate weight loss averaging up to 10 pounds was found in troops recently in combat but not in garrison troops. Among United States troops under stress of combat compared with those not exposed to stress, complaints referable to the skin, gastrointestinal tract and neuromuscular systems were more frequent, as were positive physical findings. Their weight was lower, but biochemical status was about the same and physical fitness was actually higher in the groups under stress.

In the present surveys many areas were visited in which good health had been maintained among adult populations when diet was ample and tropical diseases were well controlled. White troops were efficient after continuous presence for as much as two years in severe tropical environments. Under certain well recognized types of stress not peculiar to the tropics, men react and deteriorate similarly in tropical, temperate and cold environments. The surveys stress the importance of variety of food items, foods similar to those the soldier usually eats in ordinary life, the avoidance of caloric deficits and high acceptability insured by good preparation. The proponents of a large intake of vitamins or a low intake of animal protein are not supported by any of these data.

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TRANSMISSION OF POLIOMYELITIS TO RODENTS

Direct transmission of poliomyelitis virus from man to mice by the adjuvant use of autolyzed mouse brain tissue was reported recently by Milzer and Byrd [1] of the Michael Reese Research Foundation in Chicago. Most attempts to infect routine laboratory animals with monkey passage strains of poliomyelitis or with infected human tissues failed until 1939. Then Armstrong [2] was able to adapt the Lansing strain from monkeys to cotton rats and from the latter to white mice. Successful adaptation of a few other monkey passage strains by the same technic have been reported,[3] though most attempts to establish monkey passage strains in rodents have been unsuccessful.[4]

In harvesting brains and cords from mice paralyzed following intracerebral injection with the Lansing virus, Milzer observed that autolyzed brain tissue removed from mice left in their cages seven to eight hours after death appeared to accelerate the incubation period in passage mice. The autolyzed brain tissues were bacteriologically sterile. Preliminary experiments showed that the same acceleration could be produced by adding sterile, autolyzed brain tissues from normal mice to stock virus suspensions. Control mice and cotton rats inoculated with the autolysate alone remained normal.

Tests were made as to whether or not autolyzed brain tissues would make possible a direct transfer of monkey passage virus to the white mouse without intermediary passage through the cotton rat. Bacteria free autolyzed brain tissues were obtained from normal mice killed by trauma and kept at room temperature for sixteen hours. Ether was not used for killing, since it seemed to interfere with autolysis. A 10 per cent suspension by weight was made in nutrient broth, which was afterward freed from large particles by filtration through sterile gauze. The reaction was finally adjusted to p_H 4.00 by the use of the Hammon [5] buffer solution.

Ten per cent infected cord suspension from the twelfth monkey passage Leon strain was mixed with an equal volume of brain autolysate and injected intracerebrally into 8 mice. One mouse developed typical paralysis of both front and hind legs by the fifteenth day. This animal was killed. Its brain and cord suspension was mixed with autolyzed brain solution and used to inoculate a second group of 8 mice. These mice developed typical paralysis in from eight to thirty-two days. A fourth passage was similarly made, and all the mice developed typical paralysis in from four to seventeen days. By the fifth passage the incubation period was reduced to from two to nine days. Lesions typical of poliomyelitis were demonstrated on microscopic examination. By the sixth passage the virus was completely neutralized by human immune serum globulin, while control mice developed typical paralysis. Cross immunity tests showed that Lansing immune mice were immune to the Leon strain. Leon immune mice, however, did not show immunity to the Lansing strain.

The autolyzed brain technic was then used for direct transmission from human cases to white mice. Several strains of poliomyelitis virus from infected human feces and spinal cords have thus far been successfully transferred to Swiss mice. Immunochemical typing of these strains is now in progress. The development of a successful polyvalent vaccine is the apparent ultimate aim of the research.

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THE THIRD NATIONAL CONFERENCE ON HEALTH IN COLLEGES

On May 7 to 10 representatives from the colleges and universities of the United States will meet in New York City to confer on means of improving the health teaching, the health service and the physical education in our colleges. This Conference on Health in College, coming after the disorganization attending the war and in the midst of the emergency created by the unprecedented postwar college enrolment, promises to be of interest and importance.

From the point of view of medicine much is at stake in this conference. Here is an opportunity to emphasize the place of the college in giving students a knowledge of health and enthusiasm for physical fitness and preventive medicine. If the discussions center about providing students with clinical treatment and hospital care the conference will have failed in its true objective. A college health program can consist merely of an infirmary to which students go when they are too ill to attend classes or it can serve properly in an institution of higher learning to magnify the educational and preventive aspects of a health program. The armed services took many physicians, health teachers and physical educators from our colleges. Some institutions faltered in their health educational and preventive medical efforts during the war years under the necessity of meeting the urgent problems of the sick student. Now the colleges may again be able to take the long range view of their health responsibilities and opportunities and provide health programs designed to turn out graduates who will be leaders in the battle for well organized public health services, efficient sanitation and modern medical care and hospitalization.

In those colleges which consider themselves in loco parentis and therefore obligated to provide medical care, the student health service can be organized on the basis of voluntary prepaid medical care and hospitalization insurance and be an educational experience of real value to the student. Some state institutions, with a medical school faculty available and taxpayers footing the bills, find it easy to ignore the educational implications and provide complete medical care without any effort to relate the costs of the service to the student health service fee. This is spoon feeding medical care to the few chosen for a college career. Many develop the erroneous notion that such services are naturally owed them at little or no cost. In the coming conference the educational implications of the medical services provided our college students should also be given careful study and analysis.

Current Comment

DISSOLUTION OF SUBSTANCE OF TEETH BY LEMON JUICE

Stafne and Lovestedt [1] report observations on 50 patients who were using lemon juice routinely and who showed evidence of dissolution of dental structure. Thirty-nine of these were women and 11 were men, a ratio of approximately 4:1. The patients came from twenty-two states, two Canadian provinces, Mexico and Puerto Rico; apparently such use of lemon juice is widespread. Striking uniformity was recorded as to the manner in which lemon juice was taken, namely by interval feedings in water. Use of lemon juice in self treatment was most common among persons who were suffering from rheumatism. The juice was also used for constipation, to prevent and relieve colds and occasionally as a tonic. When used as a reduction diet, the juice most often replaced entire meals. Most patients were aware of the high vitamin C content of lemons and desired an adequate intake of that vitamin. Defects in enamel produced by action of acid solutions are recognized by rounded margins in contrast to defects produced entirely by mechanical wear, which have sharper margins. The projection of fillings above the surface of the teeth is probably of greatest diagnostic value. These observations emphasize that extensive dissolution of dental structure may occur as a result of drinking lemon juice, particularly if the juice is taken daily and at times other than with meals. An adequate amount of vitamin C can be had without resorting to improper use of lemon juice. In view of its harmful effects on the teeth, the Rochester physicians say that use of lemon juice as a daily drink in any appreciable concentration should be discouraged.

1. Stafne, E. C., and Lovestedt, S. A.: Dissolution of Substance of Teeth by Lemon Juice, Proc. Staff Meet., Mayo Clin. **22**: 81 (March 5) 1947.

CHANGES IN ARMY TRAINING PROGRAM FOR MEDICAL OFFICERS

The chief of the personnel division in the Surgeon General's Office, Col. George E. Armstrong, recently discussed [1] the army graduate training program. The professional prospects for new medical officers appear improved since Congress authorized a total increase in commissioned officers from 25,000 to 50,000. Of this number the medical department requirement was said to be 5,750, of whom 2,750 would be commissioned in the Medical Corps. The increase would radically change the ratio of Medical Corps officers to the so-called administrative group. The ratio in 1941 was about 17 medical to 1 administrative officer, while under the proposed breakdown of the Medical Department ceiling the ratio will be 1.67 medical to 1 administrative officer. Obviously the chances that a young medical officer would practice medicine in the Army will be much greater. The War Department proposes, Colonel Armstrong said, to eliminate the former haphazard method of training, assigning and retraining the army officer. The new officer will attend basic branch schools and be assigned where the type of professional career for which he is best suited can be ascertained. The War Department has stated that the basic interest of the Army and of the officer will be served by keeping officers who are trained scientists or technical experts in one line of endeavor for the greater part of their entire service. This program should go a long way toward making the Army more attractive for the young physician.

DUSTING POWDERS FOR RUBBER GLOVES

In reporting the results of an investigation on the pathologic changes produced by the deposition of lycopodium spores in human tissues, Antopol [1] in 1933 recorded an incidental case of peritoneal foreign body granulomas due to talcum that had been introduced presumably as a dusting powder on rubber gloves. His observations have since been confirmed and extended by other investigators to include peritoneal adhesions followed by intestinal obstruction and by foreign body granulomas in the rectum, vagina, cervix, brain and healing wounds; the implantation of talcum powder may be regarded as a surgical menace. Seelig, Verda and Kidd [2] have advocated the substitution of potassium bitartrate as being both harmless and efficacious. However, in powdering rubber gloves with potassium bitartrate, unless proper methods are used, especially in sterilization, the results are certain to cause deterioration of rubber gloves. When the standard technic of sterilization is followed and both the powder and the powdered gloves are subjected to 15 pounds of steam pressure for fifteen minutes, the results are uniformly favorable. If too much heat is applied or if the gloves and powder are exposed too long to the proper degree of heat, the gloves are ruined and the dusting effect of the powder is destroyed.

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ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

April 17, 1947.

President Truman Designates May 1 Child Health Day

President Truman proclaimed May 1 Child Health Day. Contrary to usual custom emphasis is being placed on guarding children against accidents. Miss Katherine F. Lenroot, head of the United States Children's Bureau, explained that accidents take an annual toll of almost 20,000 boys and girls under 20. The majority of such deaths are said to be preventable. During the week beginning April 27, efforts will be made to get facts on home accidents before parents. The Social Security Administration and the Federal Security Agency are assisting in this work in cooperation with the National Conference on Home Safety.

Permanent Nurse Corps Legislation

Legislation creating a permanent Nurse Corps in the Army and Navy and a women's medical specialist corps in the Army passed the Senate and was sent to the White House for signing by President Truman. At the present time, Army and Navy nurses hold temporary commissioned rank. Without new legislation at the end of the war emergency they would revert to prewar pay of $1,080 to $1,800 a year, and the services would have been unable to retain their nurses on this pay scale. The new legislation will commission nurses on a permanent basis, as it does male officers, and grant corresponding allowances and benefits. The women's medical specialist corps includes physical therapists, dietitians and occupational therapists.

Washington newspapers followed up the controversy created when Dr. Claude W. Munger, director of St. Luke's Hospital, New York, a past president of the American Hospital Association, accused nurses of having a "to-hell-with-patients" attitude. He reiterated charges made at a hospital conference in Roanoke, Va., and said there had been a changed attitude on the part of nurses toward patients after the American Nurses Association adopted an economic security program last September. Miss Ella Best, executive secretary of the A. N. A., denied the charges and called them unfair and ill advised.

Traffic Regulations for Car-Driving Amputees

Major Gen. G. B. Erskine, former head of the Retraining and Reemployment administration who has returned to the U. S. Marine Corps, wrote to George E. Keneipp, D. C. Director of Vehicles and Traffic, urging that some traffic restrictions be lifted for autodriving amputees. General Erskine stated: "It is my understanding that in both Seattle and New York the office of the Traffic Director, after due investigation, issues windshield cards and passbook cards of a similar nature, instructing traffic officers to exercise leniency in favor of automobiles driven by amputees in restricted areas."

Hearings on Water Pollution Control Bill

Open hearings will be held this month on a bill to provide for water pollution control activities in United States rivers. Chairman Revercomb of the Senate Public Works Committee said the measure was important enough to require public hearings. The bill is a bipartisan measure sponsored by Senator Barkley, Democrat of Kentucky, and Senator Taft, Republican of Ohio. It provides for federal aid for treatment works construction to prevent the discharge of pollution into rivers. The U. S. Public Health Service would survey specific problems of water pollution.

Gain in Births

The Census Bureau released preliminary figures estimating a total of 3,440,000 births in the United States last year, to boost the nation's population to an all time high of 141,000,000.

Commemorative Postage Stamp Will Honor Doctors of America

Postmaster General Robert E. Hannegan announced that a commemorative 3 cent postage stamp honoring the physicians of America will be issued by the Post Office Department next June 9. The special issue will come out on the hundredth anniversary of the founding of the American Medical Association. The public will be given details later of the place of sale and description of the stamp.

Encourage Employment of Nation's Disabled

The new National Association for Employment of the Handicapped will seek to carry on after the Retraining and Reemployment Administration closes June 30. The group elected Vice Admiral Ross T. McIntire, interim vice president. The former retraining administrator, Major Gen. G. B. Erskine, has resigned effective April 12 as administrator to return to the U. S. Marine Corps.

Medical Legislation

STATE LEGISLATION

Arizona

Bill Enacted.—H. 206, which has become chapter 130 of the laws of 1947, provides for the licensing, regulation and **inspection of hospitals** within the state.

Arkansas

Bill Enacted.—H. 299, which has become Act no. 326 of the Acts of 1947, provides that **all school employees** shall, biennially, produce a certificate issued by a regularly licensed physician or regularly constituted health authority certifying that such individual is free from any and all forms of contagious or infectious diseases, including tuberculosis, and that the status of such individual regarding tuberculosis has been determined by an x-ray examination.

California

Bill Passed.—S. 972, which passed the senate April 1, proposes, among other things, to authorize the state **board of chiropractic examiners** to approve chiropractic schools and colleges whose graduates may apply for licenses in the state and to set forth certain requirements which schools must meet in order to be eligible for such approval.

Colorado

Bill Passed.—H. 895, which passed the house March 28, proposes to appoint the Colorado State Department of Public Health as the sole agency for carrying out the purpose of the **federal hospital construction act** and to require the governor to appoint a state advisory hospital council.

Bill Enacted.—S. 453, which was approved March 24, amends the law relating to the **practice of chiropody** by defining the practice of chiropody as "the diagnosis and medical, surgical, mechanical, manipulative and electrical treatment of ailments of the human toe, foot and leg, excepting any amputation and excepting the administration of an anesthetic other than local."

Delaware

Bill Passed.—H. 42, which passed the senate March 31, proposes to require all persons desiring to obtain **a marriage license** to obtain a certificate from a duly licensed physician showing that the applicant has undergone a standard serologic test for syphilis and is not infected with such disease in a stage which may become communicable to the marital partner.

Bill Enacted.—H. 9, which was approved March 25, amends the law relating to the **care of the blind** by requiring every health and social agency, attending or consulting physician or nurse to report to the Delaware Commission for the Blind, in writing, the name, age and residence of persons who are blind.

Idaho

Bill Enacted.—H. 219, which has become chapter 271 of the Laws of 1947, is an enabling act for the formation and **regulation of nonprofit corporations** organized to render medical, surgical and/or hospital service on a membership fee plan.

Illinois

Bill Introduced.—H. 315 proposes the enactment of a **hospital construction act** and authorizes the director of the state department of public health to direct the hospital construction program in the state.

Iowa

Bill Introduced.—S. 469 proposes to require all physicians to report immediately to the health officer in writing the name, age and address of every person diagnosed as a case of **epilepsy** or similar disorders characterized by lapse of consciousness.

Bill Passed.—H. 465, which passed the house March 24, proposes a **hospital licensing law.**

Kansas

Bill Introduced.—H. 83, to **amend the food and drug act,** proposes to limit the sale of aminopyrine, barbituric acid, pituitary, thyroid, sulfonmethane or their derivatives, to sale on prescriptions signed by a member of the medical, dental or veterinary profession who is licensed by law to administer such drugs.

Bills Passed.—H. 67, which passed the senate April 1, proposes the enactment of a **hospital licensing law.** H. 399, which passed the senate April 1, proposes the enactment of a **hospital survey and construction act** requiring a survey of existing hospital facilities and the preparation of a program for the construction of additional needed facilities. The proposal also provides for the appointment of an advisory hospital council and authorizes the application for and receipt of federal funds to assist in the survey and construction activities within the state.

Maine

Bill Enacted.—S. 293, which was approved April 4, 1947, authorizes the local health officer to provide annually for the **free vaccination** of all inhabitants within his jurisdiction and to provide for free inoculation against diphtheria and whooping cough of all children under 12 years of age.

Maryland

Bills Passed.—H. J. R. 16, which passed the house March 22 and the senate March 27, proposes the appointment of a commission to study **medicolegal psychiatry** in the state. H. 52, which passed the house March 29, proposes to amend the medical practice act by exempting therefrom persons treating human ills in accordance with the tenets of **Christian science,** even though an adequate charge for such service is paid. H. 83, which passed the senate March 29, proposes to **amend the chiropractic act** by, among other things, defining chiropractic as "diagnosis, the location of disaligned or displaced vertebrae of the human spinal column, the procedure preparatory to and the adjustment by hand of such misaligned or displaced vertebrae of the spinal column and its articulations, by any method not including the use of drugs, surgery or obstetrics, osteopathy, optometry or podiatry, or any branch of medicine for the purpose of relieving such interference and aiding in the restoration of health, providing that nothing herein contained shall be construed to prohibit the use of by any licensed Chiropractor of all necessary electrical, mechanical, dietetic and sanitary measures incident to the care of the human body, for the purpose of relieving such interference." H. 663, which passed the senate March 29, proposes to designate the **state board of health** as the sole agency to represent the state of Maryland in obtaining benefits under the federal hospital survey and construction act and proposes also to authorize the governor to appoint an advisory council on hospital construction. S. 209, which passed the house March 31, proposes the granting of **free scholarships** to the medical school of the University of Maryland. S. 358, which passed the senate March 27 and the house March 28, proposes to exempt from the medical practice act **Christian science practitioners** duly registered in the *Christian Science Journal* of the Christian Science Publishing Society, Boston.

Massachusetts

Bill Introduced.—H. 1870, proposes the repeal of the existing law providing for the **licensing of maternity hospitals** and the enactment of new provisions which would require the licensing and regulating of all hospitals within the state.

Bill Passed.—H. 1919, which passed the house April 3, proposes that any person who was a resident of the commonwealth for a period of five years prior to July 1, 1941, who matriculated at any medical school in the commonwealth prior to said date and who since that time received a degree of doctor of medicine from such school, shall **be eligible to apply for registration** as a qualified physician, shall be examined by the board of registration in medicine and shall be subject to all the provisions of the law relating to such eligibility and examination.

Michigan

Bill Introduced.—S. 201 proposes to authorize the state commissioner of health to regulate and promulgate rules and regulations controlling the **humane use of animals** for the diagnosis and treatment of human and animal diseases, the advancement of veterinary, dental, medical and biologic sciences and the testing and diagnosis, improvement and standardization of laboratory specimens, biologic products, pharmaceuticals and drugs. The proposal would further require that no person, firm or corporation shall keep or use animals for experimental purposes unless registered to do so by the state commissioner of health.

Nevada

Bill Passed.—S. 128, which passed the senate March 19, proposes that whoever experiments or operates in any manner whatsoever on any living **dog or cat** for any purpose other than to heal, cure or sterilize said dog or cat shall be punished by a fine of not less than $100 nor more than $500 or by imprisonment for not less than three months nor more than one year, or by both such fine and imprisonment.

Bills Enacted.—S. 52, which has become chapter 230 of the Laws of 1947, amends the law relating to the state board of health by authorizing the state department to create a **division of preventive medical services,** together with such other divisions, subdivisions or bureaus as are and may be necessary for the prevention of disease, the prolongation of life and the promotion of the physical health and mental efficiency of the people of the state of Nevada. S. 55, which has become chapter 98 of the Laws of 1947, amends the medical practice act by authorizing the state board of medical examiners, in its discretion, to issue permits to any properly qualified applicant to serve as **resident medical officer** in any hospital in Nevada subject to certain provisions. Such temporary licentiate would be authorized to practice medicine only within the confines of the hospital specified in his permit and the permit would in no case be in excess of one year, renewable at the discretion of the board of medical examiners.

New Jersey

Bill Introduced.—S. 49, to amend the law relating to the **practice of chiropody,** redefines chiropody as follows: "the diagnosis of or the holding out of a right or ability to diagnose any ailment of the human foot, or the treatment thereof or the holding out of a right or ability to treat the same by any one or more of the following means: local medical, mechanical, minor surgical, manipulative and physiotherapeutic or the application of external medical or any other of the aforementioned means except minor surgical and local medical to the lower leg and ankle for the treatment of a foot ailment; not including, however, the treatment of tuberculosis, osteomyelitis, malignancies, syphilis, diabetes, tendon transplantations, bone resections, amputations, fractures, dislocations, the treatment of varicose veins by surgery or injection, the administration of anesthetics other than local, the use of radium, the use of x-rays except for diagnosis, or the treatment of congenital deformities by the use of a cutting instrument or electrosurgery. The term 'local medical' hereinbefore mentioned shall be construed to mean the prescription or use of a therapeutic agent or remedy where the action or reaction is intended for a localized area or part."

Bills Passed.—S. 66, which passed the house April 1, proposes to appoint the state department of institutions and agencies as the agency to receive federal funds to assist in a state **survey of hospitals** and the development of a state program for the construction of additional needed hospital facilities. S. 208, which passed the senate March 24, proposes to authorize the state department of health to purchase and distribute free, in accordance with rules of said department, **antibiotics** for use in preventing or treating communicable diseases.

New York

Bills Enacted.—S. 216, which has become chapter 523 of the Laws of 1947, amends the civil practice act by allowing admission in evidence of a **hospital bill bearing a certification** by the superintendent or other head of the hospital that the bill is correct, that each of the items shown was necessarily furnished and that the charge is fair and reasonable. A bill so admitted is prima facie evidence of the facts stated, subject to rebuttal by any party affected thereby. S. 1904, which has become chapter 408 of the Laws of 1947, requires any institution desiring to conduct scientific tests and **experiments on living animals** to be approved for that purpose by the state commissioner of health under such rules as the commissioner shall determine.

North Carolina

Bills Passed.—H. 623, which passed the house April 1, proposes to require laboratories making **serologic tests** to be certified by the North Carolina state board of health. H. 744, which passed the senate April 2, proposes the enactment of a hospital licensing law and the appointment of a **state advisory council.**

Ohio

Bill Passed.—H. 294, which passed the house April 2, proposes to amend the law relating to the **practice of chiropody** by authorizing the state board of medical examiners to adopt rules and regulations permitting in the practice of chiropody the use of such drugs as are necessary to such practice.

Oklahoma

Bill Introduced.—H. 339 proposes the creation of a **commission on postmortem examinations.** Among other things the commission would appoint a chief medical examiner who shall be a pathologist, trained in legal medicine and licensed or eligible for licensure in Oklahoma as a doctor of medicine by the board of medical examiners and shall maintain a laboratory for the conduct of pathologic, bacteriologic and toxicologic investigations. The proposal would authorize the county medical examiner or the chief medical examiner to perform an autopsy whenever in his opinion it was advisable and in the best public interest. He may also cause an autopsy to be made on any person when death was caused from violence, or suddenly when in apparent good health, or when unattended by a physician, or in any suspicious or unnatural manner, or as the result of abortion or suspected abortion.

Oregon

Bill Passed.—S. 77, which passed the house March 29, proposes the repeal of existing laws requiring the licensing of **maternity hospitals** and certain other types of institutions and sanatoriums and the enactment of a new law requiring the licensing, inspecting and regulating of all hospitals and related institutions within the state.

Pennsylvania

Bills Introduced.—H. 667 proposes that all prescriptions for **narcotic drugs** shall be written upon printed forms prepared and issued by the department of health and that any person using such forms shall be able to account for every one of the forms issued to him at all times. S. 384 proposes that whoever experiments or directs, aids or assists in **experiments on a living dog** in any manner for the purpose of creating or inducing in or on the body of a living dog any disease, malady, disorder or any benign or malignant growth or who performs, directs, aids or assists in the performance of any operation on a living dog for any purpose

other than the healing or curing of such dog of physical ailments or for the purpose of abating power of procreation is guilty of a misdemeanor and subject to various stated fines and imprisonment or both. S. 395 proposes to require any institution requiring for the effective carrying on of its scientific or educational activities **the use of live dogs and cats** to apply to the department of health for a license to obtain such dogs and cats from pounds in the jurisdiction. Such license would have to be renewed annually. Nothing in the proposal, however, is to be construed as affecting the right of an institution to obtain dogs and cats from sources other than public pounds.

South Carolina

Bills Passed.—H. 353, which passed the house March 17, proposes an enabling act for the organization and operation of **nonprofit corporations** for the purpose of furnishing medical service at agreed rates through participating physicians. S. 254, which passed the senate March 25, proposes to authorize **osteopathic physicians** licensed in the state to certify birth and death certificates in the same manner as is now prescribed by law for other physicians.

South Dakota

Bill Enacted.—H. 18, which was approved March 10, requires the licensing of **chiropractic hospitals,** sanatoriums or related institutions by the board of chiropractic examiners.

Texas

Bill Passed.—H. 40, which passed the house April 1, proposes the creation of a Texas **Board of Chiropractic Examiners** and defines chiropractic to be "the employment of objective or subjective means, without use of drugs or surgery, for the purpose of ascertaining the alignment of the vertebrae of the human spine, and the practice of adjusting the vertebrae by hand to correct any subluxation or misalignment thereof."

Utah

Bills Enacted.—S. 104, which was approved March 20, 1947, requires the licensing, inspecting and regulating of hospitals and the appointment of a **hospital advisory council.** S. 151, which was approved March 20, is a state **hospital survey and construction act** which requires a survey of all hospital and public health center facilities in the state and the preparation of a program for the construction of additional needed facilities. The law requires the governor to appoint an advisory hospital council and authorizes the commissioner of the state department of health to apply for federal funds for assistance in either the survey or the construction program.

Vermont

Bills Introduced.—H. 267 proposes the enactment of a **licensing law for hospitals,** sanatoriums, rest homes, nursing homes and related institutions. H. 317 proposes **a licensing law for hospitals,** sanatoriums, rest homes, nursing homes, homes for the reception of children and related institutions.

Bills Passed.—S. 38, which passed the senate March 22, to amend the law relating to the **practice of osteopathy,** proposes to designate such practitioners as osteopathic physicians and surgeons, rather than practitioners of osteopathy, and to authorize such practitioners to issue certificates relative to the commitment of insane persons, and such reports and certificates should be accepted equally with the reports and certificates of physicians of other schools of medicine. The proposal would, in effect, authorize such physicians to have the same rights with respect to the rendering of medical service under the provisions of public health, welfare and assistance laws and regulations now or hereafter in force as are possessed by the regularly licensed physicians and surgeons in the state. The proposal would also require osteopaths to have preliminary training including one year of internship in a hospital approved by the board. S. 45, which passed the senate March 28, proposes the enactment of a **hospital survey and construction act** requiring a survey of existing hospital facilities and the preparation of a program for the construction of additional needed facilities. The proposal also requires the appointment of an advisory hospital council and the acceptance of federal funds for assistance in state survey and construction activities.

Bill Enacted.—H. 164, which was approved April 1, provides an appropriation of $9,000 for the continued maintenance of the Vermont **Blood Plasma Bank.**

Wisconsin

Bills Introduced.—A. 319 proposes to prohibit the **sale of any dangerous drug** except on the prescription of a physician, dentist, chiropodist or veterinarian. The proposal defines dangerous drug to include any hypnotic drug (including acetylurea derivatives, barbituric acid or malonylurea derivatives, chloral, paraldehyde, phenylhydantoin derivatives, sulfonmethane derivatives, or any compounds or mixtures or preparations thereof that may be used for producing hypnotic effects); aminopyrine, amphetamine, desoxyephedrine, cinchophen, neocinchophen, diethylstilbestrol, ergot, cotton root, oils of croton, rue, savin or tansy, sulfanilamide or substituted sulfanilamides, thyroid, or compounds or mixtures of any such drugs. A. 382, to amend the law relating to **nonprofit sickness and care plans of medical societies,** proposes that no doctor licensed to practice under the state medical practice act shall be denied the right to participate in any other voluntary prepayment surgical, medical or sickness care plan that may be established by cooperatives or labor unions or other organized groups, or by any medical society having the powers and privileges conferred by this section and nothing contained in this section shall be construed to preclude the formation and establishment of such other plans by any one or more of said groups. A. 421, to amend the law relating to **chiropractic,** proposes to require chiropractic applicants to have graduated from a school of chiropractic approved and recognized by the board of examiners. S. 421 proposes the creation of a state board of examiners in naturopathy and **defines naturopathy** as "the prevention, diagnosis and treatment of human injuries, ailments and diseases by means of any one or more of the material methods or agencies of healing as taught by approved schools of naturopathy, said methods or agencies including dietetics, phytotherapy, vitamin or mineral or glandular food supplementations, irrigations, inhalations, external applications, physiotherapy and electrotherapy. The practice of naturopathy shall exclude the practice of medicine, surgery, obstetrics, osteopathy, chiropractic and the use of drugs. The practice of naturopathy shall exclude the treatment of cancer, tuberculosis, gonorrhea, syphilis, diphtheria, scarlet fever, typhoid fever, smallpox and fractures."

Miscellaneous

THE WORLD HEALTH ORGANIZATION

President Truman has sent to the Congress a suggested joint resolution providing for membership by the United States and participation in the World Health Organization. The President has said he is sure it will make a substantial contribution to world health conditions through the years; he considers it important that the United States join the World Health Organization as soon as possible. The resolution provides that the President is to designate from time to time to attend a specified session or sessions of the World Health Assembly not to exceed three delegates of the United States and such alternates as may be consistent with the rules of procedure of the World Health Assembly. One delegate is to be designated the chief delegate. Whenever the United States becomes entitled to designate a person to serve on the executive board of the World Health Organization, the President is to designate such a person; the one designated will be entitled to receive compensation at a rate not to exceed $12,000 per year for such period as the President may specify. Any officer of the United States is not entitled to receive compensation. The resolution also provides that the United States shall appropriate annually to the Department of State such sums as may be necessary to meet a share of the expenses of the organization and the expenses of the staff.

With the message from the President came a memorandum from the Department of State calling attention to the fact that the United States Senate expressed itself in favor of the early formation of such an organization on Dec. 20, 1945. Since that time an international health conference has been held, a constitution for a World Health Organization has been signed by sixty-one states and an Interim Commission has been established. The General Assembly of the United Nations adopted a resolution on Dec. 14, 1946 recommending that all members of the United Nations accept the constitution of the World Health Organization. The Department of State feels that such an international organization in the field of health is essential to attack diseases at their source, to prevent their spread and to raise the health level of peoples everywhere. The State Department points out that one of the purposes of the new organization is "the attainment by all people of the highest possible level of health."

The World Health Organization may assist states at their request in strengthening their national health services. This does not mean, however, that the organization will have in any way authority to interfere in the administration of health or medical care in any state. The chief functions of the organization will no doubt include the collection and improvement of worldwide disease statistics, the distribution of knowledge regarding health and medicine, the promotion of research and the continuation and further development of the highly important work done by the League of Nations in the standardization of drugs and biologic preparations. The constitution permits any government to reject any regulations that it finds unacceptable.

The structure of the World Health Organization provides for a health assembly and an executive board composed of eighteen persons designated by eighteen governments. The officials will include a director general and a secretariat. The constitution of the World Health Organization will come into force and the organization will be established when twenty-six members of the United Nations have notified the secretary general of the United Nations of their acceptance of the constitution. Thus far six members, including China, Canada, Iran, New Zealand, Syria and the United Kingdom, have taken the necessary action.

Medical Economics

MEDICAL GROUPS IN THE UNITED STATES, 1946

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The percentage of practicing physicians engaged in group practice in the United States in 1946 was approximately the same, 2 per cent, as in 1940. This conclusion is based on a comparison of studies made in 1940 by the American Medical Association and in 1946 by the U. S. Public Health Service. Under the direction of Dr. G. Halsey Hunt, Senior Surgeon, the U. S. Public Health Service is conducting a study of group practice a preliminary report of which will be published in the *New England Journal of Medicine* (in press). Just released in connection with the major report is a list of the groups which replied to a questionnaire sent out last summer. This list, "Medical Groups in the United States, 1946" (61 pages, mimeographed), was used in a comparison with the 1940 publication "Group Medical Practice," prepared by Dr. Roscoe G. Leland of the Bureau of Medical Economics. We have made a state by state comparison with respect to the number of groups and the number of physicians in groups; the number of groups in each state was expressed as a percentage of the number of groups in the nation; the number of groups in existence in 1940 which are not now in existence was tabulated; the percentage distribution of physicians in active practice in 1946 (whether in group or other types of practice) was estimated. Our analysis indicates that approximately 2 per cent of the practicing physicians are and were full time physicians on the staffs of groups as shown in the 1940 (2,093) and 1946 (3,275) studies.

Medical Groups in Geographic Divisions of the United States 1940 (A. M. A.) and 1946 (U. S. P. H. S.) Surveys

Number and Percentage of Groups, Number and Percentage of Physicians, Number of Groups on 1940 List but Not on 1946 List, and Percentage of Physicians in Active Practice in 1946; by Geographic Divisions

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Number of Groups		Percentage Distribution of Groups		Number of Physicians in Groups		Percentage Distribution of Physicians in Groups		Number of 1940 Groups Not on 1946 List	Percentage Distribution of Physicians in Active Practice in 1946
Geographic Division	1940	1946	1940	1946	1940	1946	1940	1946		
New England	6	8	2	2	67	61	3	2	1	7
Middle Atlantic	7	17	2	4	47	131	2	3	1	27
East North Central	76	88	22	21	463	597	22	18	28	21
West North Central	88	93	26	23	519	819	25	25	24	9
South Atlantic	19	26	6	6	102	204	5	6	11	11
East South Central	13	22	4	5	66	180	3	6	4	5
West South Central	62	65	18	16	356	491	17	15	28	8
Mountain	27	43	8	11	151	286	7	9	9	3
Pacific	41	50	12	12	322	506	16	16	14	9
Total	339	407	100	100	2,093	3,275	100	100	120	100

New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut).
Middle Atlantic (New York, New Jersey, Pennsylvania).
East North Central (Ohio, Indiana, Illinois, Michigan, Wisconsin).
West North Central (Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas).
South Atlantic (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida).
East South Central (Kentucky, Tennessee, Alabama, Mississippi).
West South Central (Arkansas, Louisiana, Oklahoma, Texas).
Mountain (Montana, Idaho, Wyoming, Colorado, New Mexico, Utah, Nevada, Arizona).
Pacific (Washington, Oregon, California).

The table shown herewith summarizes the comparisons by nine groups of states. The data by states (not shown) indicate that group practice is relatively prominent in Minnesota, California and Montana; contrariwise, it is not very prevalent in New York, New Jersey and Pennsylvania. New York has only one fortieth of the groups in the entire nation but approximately one sixth of all practicing physicians in the nation. Dr. Hunt lists no groups in Maine, Connecticut and Rhode Island. The items for the states are reflected in the totals for the groups of states shown in the table.

Dr. Hunt's list of 407 comprises groups classified as private, industrial, consumer, hospital, medical school or government. The following directory information is given: name, street address, medical director, business manager, primary activity, fields covered and number of physicians, nurses and dentists. The author warns the reader that there are doubtless some omissions from this list because most but not all of the known groups replied to the author's questionnaire. Except for the omission of the Lahey Clinic of Boston, it appears to me that this list is quite comprehensive.

The length of this list is due to the intention of the author to include all doubtful cases. "The only qualifications required of a group for inclusion here are, first, that it have some sort of formal organization and, second, that it have at least three full time physician members." The definition of group practice as developed by the Bureau of Medical Economics in its 1940 report would not include all these 407 groups. The Bureau's definition specified that:

1. There must be at least three physician members.
2. The receipts from medical practice must have been pooled in some manner and then redistributed to the members according to some previously arranged plan.
3. "Closed staff" hospitals were not included unless the members of the staff pooled the income received for services outside the hospital.
4. Purely "diagnostic groups" which receive only referred cases were excluded.
5. "Industrial" groups which furnish medical services to a single industry and thus to only a limited group of the general population were omitted.

Until our Bureau of Medical Economic Research completes its revision of the 1940 study by Dr. Leland we cannot estimate the number of existing groups which comply with the Bureau's 1940 definition. The 1940 report of the Bureau listed 339 groups; only 219 of these appear in Dr. Hunt's list. Apparently 120 groups were dissolved during the six years. Similarly a comparison between our Bureau's 1932 and 1940 lists showed that 63 of the 239 groups on the 1932 list had been discontinued during that eight year interval. This is evidence that the mortality rate of medical groups is significant and should be considered carefully in any study of group practice or in comparing the increase or decrease in the number of groups from time to time. It is important to know what groups organize and fail in a short time and what groups maintain themselves and their organization over a significant number of years. An additional factor of group practice which should be considered is the partnership aspect, which often necessitates complete reorganization of a group in the event of death or withdrawal of one of the partners.

The U. S. Public Health Service has made a good beginning in its study of group medical practice, and the preliminary list of 407 groups should serve as a useful directory.

Coming Medical Meetings

American Medical Association, Atlantic City, June 9-13. Dr. George F. Lull, 535 N. Dearborn St., Chicago 10, Secretary.

Aero Medical Association of the United States, Atlantic City, June 4-6. Dr. David S. Brachman, 1016 Dime Bldg., Detroit 26, Secretary.

American Association for Thoracic Surgery, St. Louis, May 28-30. Dr. Richard H. Meade Jr., 55 E. Washington St., Chicago 2, Secretary.

American Association of Genito-Urinary Surgeons, Absecon, N. J., June 4-6. Dr. Charles C. Higgins, 2020 E. 93d St., Cleveland 6, Secretary

American Association of Industrial Physicians and Surgeons, Buffalo, N. Y., Statler Hotel, April 26-May 4. Dr. Frederick W. Slobe, 28 E. Jackson Blvd., Chicago 4, Secretary.

American Association of Pathologists and Bacteriologists, Chicago, May 16-17. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland 6, Secretary.

American Association of Plastic Surgeons, Nashville, Tenn., May 5-6 and Memphis, Tenn., May 7-8. Dr. Frederick A. Figi, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Association of the History of Medicine, Cleveland, May 25-26. Dr. Howard Dittrick, 2020 E. 93d St., Cleveland 6, Secretary.

American Association on Mental Deficiency, St. Paul, Minn., May 28-31. Dr. Neil A. Dayton, Box 51, Mansfield Depot, Conn., Secretary.

American College of Allergists, Atlantic City, Hotel Senator, June 6-8. Dr. Fred W. Wittich, 401 LaSalle Medical Bldg., Minneapolis 2, Secretary.

American College of Chest Physicians, Atlantic City, June 5-8. Mr. Murray Kornfeld, 500 N. Dearborn St., Chicago 10, Executive Secretary.

American College of Physicians, Chicago, April 28-May 2. Mr. E. R. Loveland, 4200 Pine St., Philadelphia 4, Secretary.

American College of Radiology, Atlantic City, June 6-7. Mr. Mac F. Cahal, 20 N. Wacker Drive, Chicago 6, Executive Secretary.

American Dermatological Association, Murray Bay, Quebec, Can., June 1-5. Dr. Harry R. Foerster, 208 E. Wisconsin Ave., Milwaukee, Wis., Secretary.

American Geriatrics Society, Atlantic City, Hotel Brighton, June 5-7. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

American Heart Association, Atlantic City, Hotel President, June 6-7. Dr. Howard B. Sprague, 50 W. 50th St., New York, Secretary.

American Laryngological Association, St. Louis, April 23-24. Dr. Arthur W. Proetz, 12 Westmoreland Place, St. Louis 8, Secretary.

American Laryngological, Rhinological and Otological Society, St. Louis, April 25-26. Dr. C. Stewart Nash, 288 Alexander St., Rochester 7, N. Y., Secretary.

American Medical Women's Association, Atlantic City, June 7-8. Dr. Helen F. Schrack, 216 N. Fifth St., Camden, N. J., Secretary.

American Neisserian Medical Society, Atlantic City, Marlborough-Blenheim Hotel, June 8. Dr. William L. Fleming, 750 Harrison Ave., Boston, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Walter S. Atkinson, 129 Clinton St., Watertown, N. Y., Secretary.

American Otological Society, St. Louis, April 21-22. Dr. Gordon D. Hoople, 713 E. Genesee St., Syracuse 2, N. Y., Secretary.

American Pediatric Society, Stockbridge, Mass., May 13-15. Dr. Henry G. Poncher, 1819 W. Polk St., Chicago 12, Secretary.

American Physiological Society, Chicago, May 18-22. Dr. Maurice Visscher, University of Minnesota, Minneapolis, Secretary.

American Proctologic Society, Atlantic City, June 7-8. Dr. Harry E. Bacon, 2031 Locust St., Philadelphia 3, Secretary.

American Psychiatric Association, New York, Hotel Pennsylvania, May 19-23. Dr. Leo H. Bartemeier, General Motors Bldg., Detroit, Secretary.

American Radium Society, Atlantic City, June 8. Dr. Hugh F. Hare, 605 Commonwealth Ave., Boston 15, Secretary.

American Society for Clinical Investigation, Atlantic City, Chalfonte-Haddon Hall, May 5. Dr. Eugene A. Stead Jr., Grady Hospital, Atlanta 3, Georgia, Secretary.

American Society for Experimental Pathology, Chicago, May 19-23. Dr. Frieda S. Robschlit-Robbins, 260 Crittenden Blvd., Rochester, N. Y., Secretary.

American Society for Pharmacology and Experimental Therapeutics, Chicago, May 18-22. Dr. Harvey B. Haag, Medical College of Virginia, Richmond 19, Va., Secretary.

American Society for Research in Psychosomatic Problems, Atlantic City, May 3-4. Dr. Edwin G. Zabriskie, 714 Madison Ave., New York 21, Secretary.

American Society for the Study of Sterility, Atlantic City, Hotel Shand, June 7-8. Dr. John O. Haman, 490 Post St., San Francisco 2, Secretary.

American Society of Biological Chemists, Chicago, May 18-22. Dr. Otto A. Bessey, Public Health Research Institute, New York 9, Secretary.

American Society of Clinical Pathologists, Atlantic City, June 4-8. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.

American Therapeutic Society, Atlantic City, Chalfonte Hotel, June 6-7. Dr. Oscar B. Hunter, 1835 I St., N. W., Washington 6, D. C., Secretary.

Arizona State Medical Association, Tucson, May 7-10. Dr. Frank J. Milloy, 112 N. Central Ave., Phoenix, Secretary.

Association for the Study of Internal Secretions, Atlantic City, June 6-7. Dr. Henry H. Turner, 1200 N. Walker St., Oklahoma City 3, Secretary.

Association of American Physicians, Atlantic City, May 6-7. Dr. Joseph T. Wearn, Lakeside Hospital, Cleveland 6, Secretary.

California Medical Association, Los Angeles, Hotel Biltmore, April 30-May 3. Dr. L. Henry Garland, 450 Sutter St., San Francisco 8, Secretary.

Connecticut State Medical Society, New Haven, April 28-30. Dr. Creighton Barker, 258 Church St., New Haven 10, Secretary.

Federation of American Societies for Experimental Biology, Chicago, May 18-22. Dr. William H. Chambers, 1300 York Ave., New York 21, Secretary.

Florida Medical Association, Miami, April 20-23. Dr. Robert B. McIver, P. O. Box 1018, Jacksonville, Secretary.

Georgia, Medical Association of, Augusta, Bon Air Hotel, April 22-25. Dr. Edgar D. Shanks, 478 Peachtree St. N. E., Atlanta, Secretary.

Hawaii Territorial Medical Association, Lihue, Kauai, May 1-4. Dr. Harry L. Arnold Jr., 510 S. Beretania St., Honolulu 53, Secretary.

Illinois State Medical Society, Chicago, Palmer House, May 12-14. Dr. Harold M. Camp, 224 S. Main St., Monmouth, Secretary.

Kansas Medical Society, Topeka, May 12-15. Dr. John M. Porter, 512 New England Bldg., Topeka, Secretary.

Louisiana-Mississippi Ophthalmological and Otolaryngological Society, Biloxi, Miss., Buena Vista Hotel, May 5. Dr. Edley H. Jones, 1301 Washington St., Vicksburg, Miss., Secretary.

Louisiana State Medical Society, New Orleans, May 12-14. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans 13, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 22-23. Dr. W. Houston Toulson, 1211 Cathedral St., Baltimore 29, Secretary.

Massachusetts Medical Society, Boston, Hotel Statler, May 20-22. Mr. Robert St. B. Boyd, 8 Fenway, Boston 15, Executive Secretary.

Medical Library Association, Cleveland, Wade Park Manor, May 27-29. Miss Heath Babcock, New York State Medical Library, Albany 1, New York, Secretary.

Mississippi State Medical Association, Biloxi, May 6-8. Dr. T. M. Dye, Box 295, Clarksdale, Secretary.

National Gastroenterological Association, Atlantic City, June 4-6. Dr. G. Randolph Manning, Room 319, 1819 Broadway, New York, Secretary.

Nebraska State Medical Association, Omaha, April 28-May 1. Dr. R. B. Adams, 416 Federal Securities Bldg., Lincoln 8, Secretary.

New Jersey, Medical Society of, Atlantic City, Haddon Hall, April 22-24. Dr. Alfred Stahl, 160 Lincoln Ave., Newark 4, Secretary.

New Mexico Medical Society, Albuquerque, April 30-May 3. Dr. H. L. January, 221 West Central Ave., Albuquerque, Secretary.

New York, Medical Society of the State of, Buffalo, May 5-9. Dr. Walter P. Anderton, 292 Madison Avenue, New York 19, Secretary.

North Carolina, Medical Society of the State of, Virginia Beach, Va., Cavalier Hotel, May 12-14. Dr. Roscoe D. McMillan, P. O. Box 232, Red Springs, Secretary.

North Dakota State Medical Association, Fargo, May 25-27. Dr. L. W. Larson, 221 Fifth St., Bismarck, Secretary.

Ohio State Medical Association, Cleveland, May 6-8. Mr. Charles S. Nelson, 79 E. State St., Columbus 15, Executive Secretary.

Oklahoma State Medical Association, Tulsa, Mayo Hotel, May 14-16. Mr. R. H. Graham, 210 Plaza Court Bldg., Oklahoma City, Executive Secretary.

Rhode Island Medical Society, Providence, May 14-15. Dr. Morgan Cutts, 106 Francis St., Providence 3, Secretary.

Society of American Bacteriologists, Philadelphia, May 13-16. Dr. Leland W. Parr, 1335 H St. N. W., Washington 5, D. C., Secretary.

South Dakota State Medical Association, Rapid City, May 31-June 3. Dr. Roland G. Mayer, 22½ S. Main St., Aberdeen, Secretary.

Texas, State Medical Association of, Dallas, Adolphus Hotel, May 5-8. Dr. Holman Taylor, 1404 W. El Paso St., Fort Worth 3, Secretary.

United States-Mexico Border Public Health Association, San Diego, California, and Tijuana, Mexico, May 6-8. Dr. James A. Grider Jr., 151 U. S. Court House, El Paso, Texas, Secretary.

West Virginia Medical Association, Charleston, May 12-14. Mr. Charles Lively, 1031 Quarrier St., Charleston 24, Secretary.

GOVERNMENT SERVICES

ARMY

ARMY AWARDS AND COMMENDATIONS

Colonel Edmund Horgan

The Legion of Merit has been awarded to Col. Edmund Horgan, M. C., A. U. S., of Delaplane, Va., who performed exceptionally meritorious services at Foster General Hospital and later at Brooke General Hospital from January 1943 to March 1946. As noted in the citation, in his capacity as chief of the surgical service he was responsible for the organization and the close supervision of all personnel concerned with surgery at these two hospitals. The prompt and efficient handling of serious medical and surgical cases under his care insured completeness of treatment and the attainment of maximum benefits. His stimulation of higher attainment of younger surgeons and his thoroughness of technical training have reflected great credit on him and on the Medical Department. Dr. Horgan graduated from George Washington University School of Medicine in 1908 and entered the military service March 2, 1943.

Colonel Robert H. Lowry

The Legion of Merit has been awarded to Col. Robert H. Lowry, M. C., U. S. Army, of Washington, D. C., who served with distinction as commanding officer, general dispensary, and as surgeon, Military District of Washington, from February 1943 to August 1946. The superior health record established for the military district was credited by the citation for his successful solution of many problems incident to continued changes in medical personnel, supply and administration. Through his energetic efforts, superior leadership and outstanding professional skill, Colonel Lowry was primarily responsible for the high standards of operating efficiency achieved and maintained in the dispensary throughout an extended and crucial period. Dr. Lowry graduated from Rush Medical College in 1914 and entered the military service July 6, 1917.

Colonel Earl R. Denny

The Legion of Merit was recently awarded to Col. Earl R. Denny, M. C., A. U. S., of Tulsa, Okla., who, according to the citation, rendered exceptionally outstanding and meritorious service as chief of the medical service at Gardiner General Hospital, Chicago, from October 1943 to February 1946. His energetic and untiring efforts in the care and treatment of his patients, combined with his studies in the use of penicillin, resulted in the recovery of many extremely critical cases. His work in this field was a most laudable contribution to the efforts of the Medical Corps. Dr. Denny, who has also been awarded the Army Commendation Ribbon, graduated from Indiana University School of Medicine in 1925 and entered the service on May 7, 1942.

Colonel Howard E. Boucher

The Legion of Merit was recently awarded to Col. Howard E. Boucher, M. C., A. U. S., of Columbus, Ohio, for meritorious service during the period September 1940-January 1946 in a position requiring exceptional skill and ability at state headquarters, Selective Service System, Columbus, Ohio. Dr. Boucher graduated from Ohio State University College of Medicine in 1910 and entered the service Oct. 18, 1940.

Colonel Paul I. Robinson

The Oak Leaf Cluster to the Legion of Merit was recently awarded to Col. Paul I. Robinson, M. C., A. U. S. The citation read as follows: "Colonel Paul I. Robinson, successively as chief of various divisions of the Supply Service, Surgeon General's Office, was directly responsible for the evolution of a superior state of preparedness in Medical Department material planning, from December 1941 to January 1945. His foresight and the quality of his efforts resulted in plans developed in such practical detail that they were placed in operation without deviation and proved to be complete and adequate for highly successful application." Dr. Robinson graduated from Washington University School of Medicine in 1928 and entered the service Aug. 1, 1929.

Lieutenant Colonel Robert C. Gaskill

The Legion of Merit has been awarded to Lieut. Col. Robert C. Gaskill, M. C., U. S. Army. The citation stated that he performed exceptionally meritorious service from December 1941 to April 1942 on Luzon, Philippine Islands. With limited supplies, personnel and equipment, he supervised the administration of medical care so that despite the tropical climate, malnutrition and conditions of combat the medical service successfully maintained a high combat effectiveness among the troops. Dr. Gaskill graduated from the University of Texas Medical School in 1929 and entered the military service July 1, 1929.

Lieutenant Colonel Joseph E. Smadel

The United States of America Typhus Commission Medal has been awarded to Lieut. Col. Joseph E. Smadel, M. C., A. U. S., of Washington, D. C. The citation recalls that he rendered exceptionally meritorious service in the investigation of typhus fever during the period June 1943 to March 1945. First as chief of the virus division, First Medical General Laboratory, in the European Theater of Operations, and later as chief of the division of virus and rickettsial diseases at the Army Medical School, Washington, D. C., he provided special laboratory and biologic supply services which were essential to the work of the United States of America Typhus Commission and to other organizations of the Army. By his original investigations he advanced the knowledge of rickettsial infections, carried on new studies of the chemotherapy of typhus and developed a type of vaccine against scrub typhus. He contributed to practical typhus control and to the advancement of medical science. Dr. Smadel graduated from Washington University School of Medicine in St. Louis and entered the military service Aug. 17, 1942.

Lieutenant Colonel Brittain F. Payne

The Army Commendation Ribbon was recently awarded to Lieut. Col. Brittain Ford Payne, M. C., A. U. S., of New York, for the part he played "in making the course in ophthalmology at the AAF School of Aviation Medicine outstanding in every respect." Said the citation addressed to Lieutenant Colonel Payne "Your lectures were incomparably thorough and concise. The meticulous care displayed by you in the preparation of ophthalmological training aids made this complex highly technical specialty more easily and thoroughly understood by your students. You have displayed unusual devotion to duty, initiative and loyalty to your assignment." Dr. Payne graduated from the University of Texas Medical Branch, Galveston, and entered the service Nov. 22, 1942.

Captain Branch Craige Jr.

The Army Commendation Ribbon has been awarded to Capt. Branch Craige Jr., M. C., A. U. S., of El Paso, Texas, whose service with the Medical Department was stated in the citation to have been exceptional when compared with others of the same grade or similar position. Captain Craige was commended for his outstanding contribution as officer in charge of the Clinical Research Unit, organized during the Malarial Research work at Stateville Penitentiary, Joliet, Ill., through the joint effort of the University of Chicago and the Office of Scientific Research and Development for March 1945 to March 1946. Dr. Craige graduated from Harvard Medical School in 1939 and entered the military service in July 1943.

NAVY

ACTIVE DUTY FOR RESERVE OFFICERS

Naval Air Reserve Training Command, Naval Air Station, Glenview, Ill., announces that opportunities for medical reserve officers to return to active duty at one of many air stations in this command are available. As of February 25 a billet was available at Glenview for a commander flight surgeon. Government quarters are available at several of the stations. Flight surgeons receive duty involving flying which entitles them to flight pay. Individuals may terminate their active duty at any time. Reserve medical officers and pharmacists interested should write to the Bureau of Naval Personnel via the Chief of Naval Air Reserve Training, Naval Air Station, Glenview, Ill. Personnel are desired in ranks not above that of commander in the medical corps; however, captains may apply for duty in their rank requesting waiver.

MEDICAL ASPECTS OF ATOMIC WARFARE

At a meeting of medical officers, Naval Medical Center, Bethesda, Md., March 27, the subject of discussion was the medical aspects of atomic warfare, and the speakers were Dr. Shields Warren, professor of pathology, Harvard Medical School, Boston, and Capt. R. Harold Draeger (MC), U.S.N.R. Dr. Warren, formerly captain in the Naval Medical Reserve Corps, was executive officer of the Naval Medical Reserve section at the Bikini tests and Captain Draeger was officer in charge of the section directing all animal and biologic observations at Operation Crossroads. Army, Public Health, Veterans Administration and civilian doctors of the District of Columbia and Montgomery County were invited. Refreshments were served at the conclusion of the program, which was the seventh of a series sponsored by the Naval Medical School.

NAVY AWARDS AND COMMENDATIONS

Captain Ralph E. Fielding

The Bronze Star Medal and a Gold Star in lieu of a second Bronze Star were recently awarded to Comdr. (now Capt.) Ralph E. Fielding (MC), U.S.N. The citations read in part as follows: For meritorious service as medical officer on the staff of the Commander Third Amphibious Force from July 15, 1943 to March 31, 1944, when the force carried out amphibious operations for the successful seizure of Vella La Vella, Treasury, Cape Torokina on Bougainville, Green and Emirau Islands. Throughout these engagements he displayed exceptional skill in preparing and directing effective measures for the care of the wounded. His direction of the prompt evacuation and immediate administration of surgical treatment resulted in the saving of many lives.

For distinguishing himself by meritorious service as medical officer on the staff of an amphibious task force from April 1, 1944 to April 17, 1945, when amphibious operations were carried out which resulted in the seizure of islands of the Palau Group, and in the execution of the initial landings on Leyte and Luzon Islands, Philippine Islands. Plans for the evacuation and treatment of the wounded in these three operations were prepared by Commander Fielding; he participated in the operations against the enemy on Leyte and Luzon islands, during which, although subjected to numerous enemy air attacks and to threats of attack by the Japanese fleet, he capably directed the prompt evacuation and hospitalization of casualties. Throughout these periods his initiative, devotion to duty and thorough knowledge of military medicine were largely instrumental in the alleviation of much suffering and were in keeping with the best traditions of the naval service. Dr. Fielding graduated from Harvard Medical School in 1928 and began his service in the U. S. Navy July 5, 1928.

Commander Paul Harry Morton

The Air Medal has been awarded to Comdr. Paul Harry Morton (MC), U.S.N., for meritorious achievement as senior flight surgeon in Headquarters Squadron, Fleet Air Wing Seven, during operations against the enemy in the Bay of Biscay and the English Channel from Oct. 1, 1944 to May 1, 1945. The citation related that Commander (then Lieutenant Commander) Morton, participating in numerous operational flights during this period, contributed to the success of his air wing in providing protection for the supply lines in the English Channel during the advance of Allied armies through occupied France. He aided in the improvement of the physical and mental standards of United States naval aviators and plane crews. His tireless devotion to duty was in keeping with the highest traditions of the United States Naval Service. Dr. Morton graduated from Jefferson Medical College of Philadelphia in 1938 and entered the military service July 19, 1938.

MISCELLANEOUS

SALE OF SURPLUS MEDICAL SUPPLIES

From the various regional and subregional offices of the War Assets Administration notices have been received of the following sales of government surplus medical supplies in the purchase of which physicians who are veterans have certain priorities:

Columbus, Ohio, Subregional Office, 4300 East Fifth Avenue, bids open April 24. Among the equipment on sale are instruments, dressings and water sterilizers.

New York Regional Office, 37 Broadway, New York; bids received until April 23. Sale of bandages, case fitting, eyeglass, gas mask; first aid packets; rubber catheters; kit: water testing screening for chemical warfare agents; molybdenum, bone plates; surgical face masks, retractors and bone screws. Some of this property is at the Medical Supply Depot, Binghamton, N. Y., or New York Port of Embarkation, Brooklyn, Port Johnston, Bayonne, N. J., and Warehouse X-066, Corona, Long Island.

San Francisco District Disposal Office, 33 Berry Street, San Francisco 7, bids open on May 1. Large quantities of atabrine ampules and tablets for sale, some at the Stockton General Depot, Stockton, Calif., some at the Naval Medical Supply Depot, Oakland, and some at the San Francisco Medical Depot, 1855 Folsom Street, San Francisco.

Kansas City Regional Office, 95th and Troost, Kansas City, Mo.; sale closes April 21. Among items for sale are stretchers, litters, anatomical charts, portable emergency operating lamps, thermometers, sulfapyridine tablets, patients' chairs with head rest, hospital and utensil sterilizers (used), surgical instruments (used).

Birmingham Regional Office, 1955 North Fiftieth Street, Birmingham, Ala.; sale now is on a first come first serve basis. Among items for sale are dissecting scissors, bone chisels, bone clamps, curets, surgical knives, retractors, trephine sets, bone drills, dilators, bone forceps, sterilizers, distilling apparatus, surgical needles, food carts, operating lamps, luer syringes, catheters, oxygen tents.

Louisville Regional Office, 412 West Market Street, Louisville 2, Ky.; bids opened April 28. Among items for sale are large quantities of catgut, silkworm, braided silk, nylon, horsehair and kangaroo sutures and wound clips.

Indianapolis Subregional Office, 2005 Northwestern Avenue, Indianapolis; bids to be opened April 29. Among articles for sale are whirlpool baths, eye magnet, clinical lamp, tantalum foil, Thomas splints. The bids to another sale under the jurisdiction of this subregional office will be opened April 28 and include, among other things, gauze bandages, food carts, hospital screens, crutches and first aid kits.

Seattle Regional Office, 1409 Second Avenue, Seattle; bids received until 11 a. m., April 22. Among the items for sale are blood transfusion apparatus, dermatome cement, rubber blankets and bedside tables.

PHYSICIANS SEPARATED FROM SERVICE

ARMY MEDICAL CORPS OFFICERS RECOMMENDED FOR/OR RELIEVED FROM ACTIVE DUTY

Alabama

Bell, Hugh V. Jr.....Grady
Relfe, Conyers B.....Mount Meigs
Stabler, Aubrey A.....Greenville
Tildon, Toussaint T.....Tuskegee
Weatherly, George I. Jr.....Ft. Payne

Arizona

Risser, Christian F.....Tempe

Arkansas

Noel, Elmer, H.....Ft. Smith
Oldham, Hershell B.....Helena
Riley, James R.....Pine Bluff

Colorado

Freed, Charles R.....Denver
Mizer, Floyd R.....Denver
Tilden, James F.....Olathe

Connecticut

Dunn, Morris L.....New Britain
Fleisher, Philip.....Bridgeport
Messina, Michael C.....Hartford
Singh, Harkishen.....Windsor
Stonington, Oliver G.....Darien

District of Columbia

Koch, Leslie C.....Washington
McClung, Marshall L.....Washington
MacMurray, Frank G.....Washington
Mangham, Charles A.....Washington
Paul, Norman.....Washington
Weinberg, Benjamin A.....Washington

Florida

Patterson, James N.....Jacksonville
Patton, Sherrel D.....Sarasota
Simon, Sydney M.....St. Petersburg

Indiana

Blake, William B. Jr.....Marion
Duffner, Robert J.....Ft. Wayne
Frantz, Mount E.....Danville
Herrold, Don W.....Grass Creek
Houser, Harold B.....N. Liberty
McNamara, John P.....Noblesville
Miller, Charles J.....Greensburg
Rosenak, Bernard D.....Indianapolis
Schantz, Richard.....Remington
Travis, Julius C. Jr.....Indianapolis
Van Arsdall, Clarence R.....Terre Haute
Williams, Charles E.....Dale
Wills, Max B.....Anderson

Iowa

Bartel, Robert M.....Council Bluffs
Cobb, Elliott A.....Sioux City
Nelson, Frederick L.....Ottumwa
Scannell, Raymond C.....Carroll
Struble, Gilbert C.....Ottumwa
Tyler, William H.....Iowa City

Kansas

Moore, Robert H.....Lansing
Slavin, Manuel .....Leavenworth

Kentucky

Jones, Hubert C.....Bedford
Otis, Edwin J.....Ashland
Peery, Clarence E. Jr.....Majestic
Starr, Robert R.....Glasgow
Threlkel, Frank H.....Beaver Dam
Trangsrud, Howard A.....Louisville

Louisiana

Bendel, William L. Jr.....Monroe
Hennigan, Henry W.....New Orleans
Miller, Roger F.....Jennings
Phillips, Stonewall J.....Alexandria
Soileau, Gordon E.....Ville Platte

Maryland

Buettner, Henry F.....Baltimore
Clarke, Harry G.....Perry Point
French, Samuel L.....Rumbley
Gaalaas, Alban F.....Pasadena
Kibbe, Frank W.....Catonsville
Moses, Benjamin B.....Baltimore
Richardson, Edward J. Jr.....Baltimore
Tietze, Christopher.....Baltimore
Turner, Roy B. Jr.....Baltimore
Urlock, John P. Jr.....Baltimore

Massachusetts

Bigelow, Frederick S.....Concord
Denniston, Baron D.....Boston
Dunn, Russell A.....Baldwinsville
Kemler, Norman.....Medford
McLaughlin, Joseph H.....Dorchester
Moore, George R.....Somerset Center
Nelson, Roy W.....Attleboro
Nochimow, Eliezer.....New Bedford
Schwartz, Theodore.....Springfield
Simonetti, Louis J.....Lexington
Stein, Tobias.....Boston
Sturgis, Somers H.....Cambridge
Townsend, James H.....Boston
Weidman, Abraham.....Cambridge
Zalon, Leo.....Bridgewater

Michigan

Benson, Davis A.....Detroit
Combs, Robert G.....E. Lansing
Cosgrove, William J.....Grand Rapids
Meade, William H.....Lansing
Mudd, Richard D.....Saginaw
Mullenmeister, Hugh F.....Battle Creek
Risk, Robert D.....Muskegon Heights
Steiner, Max.....Detroit
Tinetti, Ernest F.....Laurium
Van Ark, Bert.....Eaton Rapids
Weisberg, Jacob.....Detroit

Minnesota

Anderson, Chester A.....Buffalo
Lengby, Frederick A.....St. Paul
Mattson, Hamlin A.....Minneapolis
Olson, Albert J.....Cloquet
Phares, Otto C.....Minneapolis
Posch, Joseph L.....St. Paul
Rossberg, Raymond A.....St. Paul
St. Cyr, Kenneth J.....Osseo
Tifft, Cyril R.....St. Paul
Van Hale, Laurence A.....Minneapolis

Mississippi

Crews, John P.....Inverness
Meriwether, Lodwick S.....Jackson

Missouri

Becker, George H.....St. Louis
Foster, Leon.....St. Louis
McCorkle, Elbert L.....Marshall
Milder, Benjamin.....Clayton
Nelson, Charles S.....Kansas City
Rice, Grover C.....Kansas City
Schill, Austin E.....St. Louis
Tahir, Mohammad.....St. Joseph
Trotter, Francis O. Jr.....Kansas City

Nebraska

Anderson, Thorwald R.....N. Platte
Mac Innes, Kenneth A.....Omaha
Stappenbeck, Richard F.....Brock

New Hampshire

Eastman, Cyrus D.....Monroe
McCooey, James F.....Dover
Solomon, Philip.....Franklin

North Dakota

Miller, Samuel.....Ellendale

Ohio

Backiel, Leonard A.....Cleveland
Cowan, Abe M.....Maple Heights
Cranmer, Linus R.....Steubenville
Fletcher, Paul F.....Cincinnati
Langan, Paul C.....Akron
Lowenthal, Gerson.....Cincinnati
Moore, John M.....Piney Fork
Mowry, Benjamin F.....Findlay
Orebaugh, John E.....Norwalk
Phillips, Roy A.....Cincinnati
Polot, David M.....Cleveland Heights
Risley, Clarence T.....Conneaut
Robinett, Robert W.....Chillicothe
Schmiesing, Werner F.....Minster
Smith, Quentin, B.....Bellevue
Twinem, Adrian C.....Cincinnati
Updegraff, Ralph K.....Lakewood
Vogelsang, Aaron D.....Toledo
Votypka, Joseph A.....Cleveland
Werner, Merrill J.....Dayton

Oklahoma

Bolton, Houck E.....Oklahoma City
Ohl, Charles W.....Chickasha
Water, Claude B.....Duncan

Oregon

Lawson, Earl L.....Portland
Skelley, Leo C.....Portland
Smith, Charles H.....Portland

Pennsylvania

Bellarmino, Francis M.....Philadelphia
Blumer, Max A.....Pittsburgh
Cooper, Ray C.....Tower City
Dasch, Frederick W.....Forty Fort
Derr, Frederick S.....Williamsport
Dyson, John M.....Hazleton
Gibson, Frederick C.....Latrobe
Haeckler, William S.....Pittsburgh
Johnson, Alfred T.....W. Reading
Junk, Ivan D.....New Albany
Kumian, Edward S.....Philadelphia
Lavelle, James P.....Scranton
McCullough, John D.....Coatesville
Pirrung, Mathew C.....Altoona
Reynolds, Arthur S.....Llanerch
Rice, Donald H.....McKeesport
Rudnick, Herman D.....Philadelphia
Schloss, Eugene M.....Philadelphia
Schwab, Carl L.....Harrisburg
Smiley, Bernard.....Scranton
Stewart, Harry L. Jr.....Philadelphia
Toewe, Clinton H.....Lansdale
Tucker, Harry E.....Philadelphia
Valverde, Mario F.....Scranton
Warakomski, Alphonse S.....Nanticoke

South Carolina

Bell, John W.....Greenville
Fuller, Lawrence S.....Columbia
Timmerman, Wm. Bledsoe.....Charleston

Tennessee

Armstrong, John L.....Somerville
Galbraith, Ben T.....Henderson
Phillips, Paul G.....Nashville
Prescott, Kenneth H.....Mountain Home
Puryear, Thomas R.....Lebanon

Utah

Bingham, Leonard J.....Salt Lake City
Brewerton, Joseph O.....Salt Lake City
Burdett, Ray E.....Ogden
Carter, Grover C.....N. Logan
Mohr, Alzon J.....Providence
Paul, Leslie J.....Salt Lake City
Smith, Silas S.....Salt Lake City

Vermont

Woodruff, Frank E.....Barre

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Annals of Western Medicine and Surgery.—This new monthly journal began publication in March under the auspices of the Los Angeles County Medical Association. With an initial circulation of 7,500 copies it will serve three medical schools and more than 5,000 physicians in Los Angeles County alone. Contributions of fairly general rather than technical interest are preferred, as the majority of those who receive the *Annals* are engaged in general practice. The need for such a publication has become apparent since the *Southern California Practitioner*, founded in 1886, was discontinued in 1943 for lack of financial support. Dr. Edmund T. Remmen, Los Angeles, is the editor.

Organize Emergency Centers.—The board of supervisors of Los Angeles County has ordered to be organized a chain of seventy-one emergency hospital and ambulance centers, which would be responsible for transporting injured persons to regular hospitals nearest the scenes of accidents. Incorporated communities in the county were urged to pay for the services given persons injured within their boundaries through contracts with the county. Private ambulance operators and hospitals are expected to furnish the personnel and equipment for this work under county contracts. The cost of the program, including installations, is estimated at about $70,000 for the first year, according to the Los Angeles *Times*. This plan is expected to clear up the confusion that exists when injured persons have been left for some time where an accident occurs because of disputes as to which community should assume responsibility in caring for them.

Annual State Medical Meeting.—The seventy-sixth annual session of the California Medical Association will meet April 30-May 3 at the Biltmore Hotel, Los Angeles, under the presidency of Dr. Samuel J. McClendon, San Diego. In addition to numerous presentations by Californians, the following from other states will speak:

Dr. Ashley W. Oughterson, New York, The Diagnostic Problem in Gastrointestinal Cancer.
Dr. Albert M. Snell, Rochester, Minn., Infectious (Viral) Hepatitis and the Public Health.
Dr. Hobart A. Reimann, Philadelphia, Periodic Diseases.

The fourteen sections have arranged extensive programs to be presented by members of the association. The Section on General Medicine will have a panel discussion of virus diseases Wednesday, another on diseases of the stomach Thursday, and a symposium on "What's New" on Friday. There will be a clinical pathologic conference Friday afternoon. The Section on General Surgery will hold a symposium on back pain Thursday afternoon and a panel discussion on breast tumors Friday morning. A symposium on arthritis and another on urinary tract infections are part of the program of the Section on General Practice. The Woman's Auxiliary will also meet at the Biltmore April 30 to May 2.

CONNECTICUT

Cancer Consultative Clinic Opened.—The first cancer consultative clinic sponsored by the Connecticut Cancer Society opened January 28 with five physicians in attendance. The clinic, which will serve persons throughout the state, is open Tuesday mornings from 9 to 12 at McCook Memorial Hospital, 2 Holcomb Avenue, Hartford.

Rehabilitation.—At the first public meeting of the newly organized Connecticut Rehabilitation Association, held recently in New Haven, Dr. Howard A. Rusk, head, department of rehabilitation and physical medicine, New York University College of Medicine, and associate editor of the New York *Times*, spoke on "Restoration of the Disabled to Useful Living."

Commission on Alcoholism.—The former Yale School Plan Clinics have been taken over by the commission on alcoholism of the state of Connecticut. The commission was created in 1945 by the general assembly along with a state fund for inebriates and was charged with planning for outpatient and inpatient care and treatment and detention of patients suffering with alcoholism. Dr. Theodore P. Sohler, who has been at the Psychiatric Clinic of Yale School of Medicine at New Haven Hospital as physician in charge, has been added to the staff as a full time clinical psychiatrist. Additional clinics or facilities are to be set up in the major population centers of the state. Dr. Dudley P. Miller, New Haven, executive director of the commission, said he hoped to establish relations with private, municipal and state social agencies, hospitals and courts whereby the work of the commission and the agencies may be of mutual benefit in caring for alcoholic addicts.

GEORGIA

Prize to Encourage Writing.—An annual prize of $100 for the best paper or case report by a younger member of the Fulton County Medical Society will be given by Drs. Walter W. Daniel and John C. Ivey, Atlanta. The recipient must, at the time he makes his presentation, have been a member of the society for not more than five years, provided he joined within six months after completing his hospital training. The award will be made at the annual meeting each year.

Annual State Medical Meeting.—The Medical Asssociation of Georgia will hold its ninety-seventh annual session April 22-25 in Augusta at the Bon Air Hotel under the presidency of Dr. Ralph H. Chaney, Augusta. The house of delegates will meet Tuesday afternoon and evening. At the scientific sessions beginning Wednesday Dr. Edward L. Bortz, Philadelphia, President-Elect of the American Medical Association, will deliver the Abner Wellborn Calhoun Lecture. Among the other speakers will be:

Dr. Max M. Peet, Ann Arbor, Mich., Bilateral Supradiaphragmatic Splanchnicectomy in the Treatment of Arterial Hypertension.
Dr. Howard A. Howe, Baltimore, How Is Poliomyelitis to Be Controlled?
Dr. Clarence A. Good Jr., Rochester, Minn., Roentgenologic Diagnosis of Tumors of the Small Intestine.

The Woman's Auxiliary will hold its annual convention April 22-24. The annual banquet and dance will be Thursday at 7:30 p. m. Annual dinners for the alumni of Emory University School of Medicine, Atlanta, and the University of Georgia School of Medicine, Augusta, are scheduled for Wednesday night. Special societies having luncheons during the sessions are the Georgia Eye, Ear, Nose and Throat Society, the American Medical Women's Association, the Georgia Pediatric Society and the Georgia Roentgenological Society.

ILLINOIS

Typhoid Vaccine Given Following Flood.—About 1,000 residents of Chicago Heights and Robbins were given typhoid vaccine April 8 following the preceding week's flood in the southern and western parts of Cook County. Dr. Edward A. Piszczek, county health officer, announced that a series of three weekly injections will be offered to some 6,000 persons.

Appoint Superintendent of Sanatorium.—Dr. Robinson Bosworth, East St. Louis, former president of the National Tuberculosis Association, has signed a three year contract as medical director and superintendent of the Rock Island County Sanatorium. He was formerly employed as medical director at the Rockford sanatorium and in 1937 was employed in St. Clair County, where he built the new sanatorium and served as medical director until 1946. Dr. Bosworth received his M.D. degree at Jefferson Medical College of Philadelphia in 1905.

Health Departments Consolidate.—Election returns of April 1 recorded a vote in Adams County for consolidation of the Quincy Public Health District with the Adams County Public Health Department by a plurality larger than any received by candidates for office, according to Dr. Roland R. Cross, Springfield, state director of public health. Consolidation approved by vote was a necessary step in securing an overall public health service for Adams County including the city of Quincy. The Adams County Board of Health will assume jurisdiction over the Quincy area March 31, 1948.

Chicago

Society News.—At the annual meeting of the Chicago Dermatological Society Drs. Francis W. Lynch, St. Paul, was elected president, Stephen Rothman vice president and Leonard F. Weber secretary-treasurer.

The Zeit Memorial Lecture.—The Frederick Robert Zeit Memorial Lecture will be delivered on May 15 at 4 p. m. in Thorne Hall by Dr. W. Barry Wood Jr., Busch professor of Medicine, Washington University School of Medicine, St. Louis, on "Mechanisms of Recovery in Bacterial Pneumonia." The lecture is sponsored by the Xi chapter of Alpha Kappa Kappa, Northwestern University Medical School, Chicago, in honor of the late Dr. Zeit, former professor of pathology.

INDIANA

Personal.—Rolla N. Harger, Ph.D., professor of biochemistry and toxicology in the Indiana Universtiy School of Medicine, Bloomington-Indianapolis, has joined the staff of the Indiana Bureau of Industrial Hygiene as consultant on toxicology.

Diphtheria Prevention in Sullivan County.—In 1937 the Sullivan County Medical Society began a program of immunization against diphtheria in the county to continue for ten years or longer if necessary to evaluate the results. During the past ten years more than 9,000 persons, or one third of the population of the county, have been given diphtheria toxoid immunization. Most of the counties bordering on Sullivan County have had mild epidemics of diphtheria since 1936, but only 4 cases have been reported in Sullivan, 3 in 1938 and 1 in 1944, all in families that had not been immunized. In the previous decade 1927 to 1936 Sullivan County reported 109 cases of diphtheria with 19 deaths. In the decade ended with 1945 there were 8,053 cases of diphtheria, with 659 deaths reported in the entire state of Indiana.

MASSACHUSETTS

Diphtheria in Boston.—The health commissioner of Boston, Dr. John H. Cauley, reports that the number of cases of diphtheria in Boston has continued to increase steadily and that immediate action must be taken to control the disease. In the six years preceding 1946 there were 179 cases with 10 deaths and in 1946 there were 157 with 10 deaths. During January and February 66 cases developed in Boston, the greatest number that has occurred in any two months during the last fifteen years. A citywide campaign for diphtheria immunization has been conducted. Physicians are urged to emphasize the need for immunization and booster doses. The health department advocated that all children be taken to their own physician or, where not practical, to clinics provided by the health department and school authorities. Toxoid is available free of charge to all city culture stations.

Public Health Appointments.—Dr. Eugene R. Sullivan, Milton, has been appointed an assistant director, Division of Biologic Laboratories, Massachusetts Department of Public Health. Dr. Sullivan, recently a lieutenant colonel in the U. S. Army Medical Corps, served three years overseas as chief of laboratories, Sixth General Hospital, as consultant on blood and blood transfusions for the North African and Mediterranean theaters of operation and on a board for the study of the treatment of the seriously wounded. Formerly Dr. Sullivan held positions at Harvard Medical School, the Massachusetts General Hospital and the University of Michigan School of Public Health.——Dr. Salvatore R. Traina, Boston, former command surgeon of the Seventh Air Service Area Command in Tokyo, is now serving as physician in charge of the mobile unit of the State Blood Donor Program, Division of Biologic Laboratories, Massachusetts Department of Public Health. Dr. Traina served for twenty-eight months in the Asiatic-Pacific theater, being discharged with the rank of major. ——Dr. Barbara F. Carter, Boston, has been appointed assistant district health officer of the North Metropolitan District, Massachusetts Department of Public Health. Dr. Carter formerly was house officer and assistant resident, Third Medical Service, Boston City Hospital.

NEBRASKA

Annual State Medical Meeting.—The seventy-ninth annual convention of the Nebraska State Medical Association will be held April 28-May 1 at the Hotel Paxton, Omaha, under the presidency of Dr. George E. Charlton, Norfolk. As a departure from the customary scientific program, afternoons will be devoted to informal panel discussions during which members will have an opportunity to present individual problems to guest speakers. During the morning sessions formal lectures will be delivered. The guest speakers will be:

Dr. Frank R. Peterson, Iowa City, Cancers in Small Bowel.
Dr. Willis M. Fowler, Iowa City, New Agents in Treatment of Blood Dyscrasias.
Mr. Frank E. Smith, Chicago, A Doctor Enters the Insurance Field.
Dr. Robert C. Bassett, Ann Arbor, Mich., Surgical Management of Intractable Pain.
Dr. John M. Sheldon, Ann Arbor, Urticaria and Angioneurotic Edema.
Dr. Cameron Haight, Ann Arbor, Diagnosis and Management of Bronchogenic Tumors.
Dr. Henry K. Ransom, Ann Arbor, Gastric Ulcer: End Results of Treatment.
Dr. William E. Adams, Chicago, Cancer of the Esophagus.
Dr. Park J. White, St. Louis, Treatment of Certain Serious Infections in the Newborn Infant.
Dr. Thomas K. Brown, St. Louis, Management of Difficult Labor.
Dr. Robert J. Crossen, St. Louis, Cancer Potential in Involuting Organs.
Dr. Philip Lewin, Chicago, Treatment in the Early Stages of Poliomyelitis.

Topics for panel discussion Tuesday are Medical and Surgical Aspects of Blood Dyscrasias, Surgical Treatment of Hypertension, Congenital Atresia of the Esophagus, Tracheoesophageal Fistula; for Wednesday, Surgical Aspects of Carcinoma of the Colon, Abdominal Allergy and Anuria and Oliguria; Thursday, The Rh Factor and Erythroblastosis, Vaginitis in Pregnancy, The Thymus Problem, Sterile Marriages and Functional Uterine Bleeding. The Tuesday evening dinner will be addressed by Dr. Harrison H. Shoulders, Nashville, Tenn., President of the American Medical Association, on "Some Problems in the Economics of Medical Care." The Woman's Auxiliary will meet April 29 to May 1. There will also be exhibits.

Physician Honored.—Dr. John A. Waggener, Humboldt, who is completing his seventy-first year of medical practice, was honored in one of the nationwide centennial radio broadcasts February 15, conducted by the American Medical Association. Dr. Waggener came to Richardson County in November 1878. He is 94 years old.

NEW YORK

County Society Meeting.—At a meeting of the Saranac Lake Medical Society, March 5, Dr. George W. Thorn, Hersey professor of the theory and practice of physic, Harvard Medical School, Boston, and physician-in-chief, Peter Bent Brigham Hospital, Boston, spoke on "Recent Advances in Hormone Therapy."

Hospital Centennial.—Rochester General Hospital, Rochester, will mark a century of service May 7. Open house at the hospital in observance of National Hospital Day May 12, clinic day, arranged by the medical staff at the Academy of Medicine, and a banquet at the Seneca Hotel May 15 are a part of the centennial celebration.

Dr. Loper Honored.—A testimonial banquet was recently given by the executive board of the Eastern Long Island Hospital and the medical staff in honor of Dr. Arthur C. Loper of Greenport, who has practiced medicine for fifty years in that community and served many years as chief of staff of the hospital. Dr. Loper, a graduate of the College of Physicians and Surgeons in Baltimore, is the oldest member on the hospital staff.

New York City

Personal.—Dr. Bernard Samuels, New York, will give the Montgomery Lecture at the annual meeting of the Irish Ophthalmological Society, Trinity College, University of Dublin, Ireland, May 22, on sympathetic ophthalmia.

Ragweed Control.—The health department's pioneer ragweed control program last summer resulted in a reduction in atmospheric pollen for that season to the lowest count since 1937. A short comprehensive course of instruction on the control of noxious plants for the directors and sponsors of control programs in communities in the metropolitan area is being arranged by New York University.

Annual Rheumatism Association Meeting.—The annual meeting of the New York Rheumatism Association will be held at the Cornell University Medical College April 19 at 2:30 p. m. Subjects to be discussed are "The Relationship Between the Sacroiliac and Spinal Findings in Marie-Strümpell Spondylitis," "Intravenous Procaine in the Treatment of Arthritis," "Further Developments in the Etiology of the Shoulder-Hand Syndrome," "Cardiac Manifestations of Rheumatoid Arthritis" and "Neuromuscular Changes in Rheumatoid Arthritis."

Course for Institutional Food Handlers.—A course in sanitation for institutional food handlers was begun recently in New York City by Health Commissioner Israel Weinstein in connection with a campaign to clean up eating places and improve food handling methods. The course, opened on March 22, is being continued on Saturdays for fourteen weeks in the Fort Green Health Center, Brooklyn, for persons in hospitals, homes and other institutions who supervise the handling of food, under the auspices of the Catholic Charities of the Diocese of Brooklyn. The course is similar to one being given by Dr. Weinstein in Manhattan.

Two Deaths from Smallpox.—Following the disclosure April 4 that an American business man who contracted smallpox in Mexico died in the Willard Parker Hospital for Contagious Disease in March, New Yorkers are responding to the suggestion that those who have not been vaccinated since childhood do so immediately. Of three other persons who subsequently developed smallpox one died and two are recuperating at the hospital. Special clinics set up at all health centers are open until 8 p. m., and all hospital authorities have been asked by the hospital commissioner to maintain twenty-four hour service in their emergency wards for vaccinations. An intensive campaign

of vaccination is already under way. Under the health laws all persons having contact with smallpox must be vaccinated or be subjected to strict surveillance by the health department for twenty-one days. The city and state health departments have joined the U. S. Public Health Service in an effort to trace contacts made by the smallpox victim en route from Mexico to New York.

Health Department Closes Five Restaurants.—Five eating places were closed, temporarily at least, March 20 by the city health commissioner. Three of the restaurants had their kitchens and all equipment sealed, while two others shut their doors for repairs before the health department arrived. Notice had previously been sent to six restaurants to clean up within forty-eight hours or be closed. Places closed were a sandwich shop at 373 Lexington Avenue, whose manager has been fined three different times since last September for lack of sanitation. The C. & H. Cafeteria, 118 Grattan Street, and the R. & B. Delicatessen Restaurant, 767 Nostrand Avenue, were sealed. Both places had previously been fined in court. The cafeteria did not have a permit from the health department as required by law, the chief inspector of food and drugs said. The two that stopped service voluntarily were a bar and grill in Williamsburg, Brooklyn, and a catering kitchen in a church center on the West Side of Manhattan. Since the restaurant cleanup campaign began last June 6, there have been 16,963 places inspected and 2,231 summonses have been served, resulting in 2,163 fines.

OHIO

Society News.—Dr. Paul R. Cannon, University of Chicago department of pathology and president, American Society for Experimental Pathology, addressed the Mahoning Medical Society, Youngstown, in February on "Recent Advances in Protein Nutrition."

Narcotic Violation.—Dr. M. F. Vereker, 71, of Hamilton was fined $8,000 and placed on probation for two years by U. S. District Judge John H. Druffel, March 19. Dr. Vereker, indicted the previous week for selling prescriptions for narcotics to addicts, was ordered to surrender his federal narcotic license. Judge Druffel suspended the prison sentence because of Dr. Vereker's advanced age.

OREGON

Oppose Increase in Office Rental Space.—The Multnomah County Medical Society, Portland, faced with a 25 per cent increase in office space rental imposed March 5 by the management of the Medical Dental Building, met with the dental society and passed a resolution "condemning the inflationary increase in office rent and other items of overhead expense." Dr. Willard F. Hollenbeck, president, Multnomah County Medical Society, said "the medical society feels that it is in the public interest to prevent any further increase which will reflect in the cost of medical care." The management of the Medical Dental Building, it is said, has increased rents 64.5 per cent over those of 1944. When the manager and owners of the Medical Dental Building were advised of the action of the societies and invited to meet and discuss the rental increase, they failed to appear.

PENNSYLVANIA

Ophthalmology and Otolaryngology Meeting. — The annual meeting of the Pennsylvania Academy of Ophthalmology and Otolaryngology is set for April 26-27 at the Penn-Harris Hotel, Harrisburg. The group will be addressed by Drs. William L. Benedict, Rochester, Minn., on "Tumors of the Orbit"; Thomas B. McCollough, Pittsburgh, "Surgical Considerations of Supposed Nasal Allergy"; Francis H. Adler, "Problems in Diagnosis and Treatment of Chronic Simple Glaucoma"; Albert P. Seltzer, Philadelphia, "How to Do a Complete Rhinoplasty and Common Errors in Nasoplastic Surgery"; LeRoy M. Polvogt, Baltimore, "Irradiation of the Nasopharynx," and Charles F. Kutscher, Pittsburgh, "Contusions of the Eyeball."

Pittsburgh

Occupational Disease Diagnostic Clinic.—The School of Medicine of the University of Pittsburgh has established an occupational disease diagnostic clinic at the Falk Clinic. Each Saturday it is open to cases referred by physicians for study and diagnosis only, the reports being transmitted on completion of study to the referring physician. Fees for necessary laboratory work or hospital expense when deemed advisable will be charged. The clinic will provide also facilities for graduate students in industrial medicine who are enrolled in the School of Medicine.

SOUTH CAROLINA

Annual State Medical Meeting. — The South Carolina Medical Association will hold its ninety-ninth annual session May 6, 7 and 8 at Myrtle Beach under the presidency of Dr. James C. McLeod, Florence. The sessions will be addressed by:

Dr. Robert H. Felix, Washington, D. C., Development of a Mental Hygiene Program in a State.
Dr. Eugene P. Pendergrass, Philadelphia, How to Prevent Death from Cancer of the Breast.
Dr. Alfred W. Adson, Rochester, Minn., Headache.
Dr. Jessie Wright, Pittsburgh, Acute and Convalescent Stages of Poliomyelitis in Respect to Responsibility of Physical Medicine.
Dr. J. Earle Moore, Baltimore, Treatment of Syphilis.

A new feature will be the round table discussion on Thursday morning. Doctors will be allowed six minutes each to present what's new in allergy, dermatology, pediatrics, cardiology, chemotherapy, gastroenterology, obstetrics and gynecology, surgery, orthopedics and otolaryngology. Following this, questions from the audience will be answered. At the banquet Wednesday evening at 8 o'clock Dr. Pendergrass will speak on "The Atomic Bomb from Personal Observation at Bikini," showing moving pictures.

Richland County Tuberculosis Program. — An x-ray survey and health education program in Richland County has been announced by Dr. Edward P. White, Columbia, director, county health department. Every school child from the eighth through the twelfth grade and a large portion of the adult population will be given an opportunity to have chest x-ray pictures made. A follow-up of all cases considered positive will be made by a worker from the Richland County Tuberculosis Association and by staff nurses of the county health department.

TENNESSEE

Personal.—Dr. Thomas Lee Gore has been appointed superintendent of the Davidson County Hospital, Nashville, to succeed Dr. Ralph C. Eades, resigned. Dr. Gore, a graduate of the University of Pennsylvania School of Medicine, Philadelphia, served in France during the first world war and was in the Army Medical Corps until 1939, when he retired and went into business in Texas.

Annual State Medical Meeting. — The Tennessee State Medical Association held its one hundred and twelfth annual meeting in Memphis April 8-10 under the presidency of Dr. Charles M. Hamilton, Nashville. Among the guest speakers were:

Dr. Abraham Levinson, Chicago, Diagnosis and Treatment of Meningitis.
Dr. George F. Lull, Chicago, Secretary and General Manager, American Medical Association.
Dr. Joseph G. Molner, Detroit, Epidemiology and Recent Developments in Poliomyelitis.
Col. William C. Porter, M. C., Houston, Texas, Neuropsychiatry for the General Practitioner.
Dr. Ursus V. Portmann, Cleveland, Role of Surgery and Radiation Therapy for Cancer of Breast.
Frank E. Smith, Ph.D., Director, Associated Medical Care Plans, Chicago, A Doctor Enters the Insurance Field.
Dr. Harrison H. Shoulders, Nashville, President, American Medical Association, Some Problems in the Field of Medical Economics.
Dr. Dudley C. Smith, Charlottesville, Va., Management of Early Syphilis.
Dr. Fletcher D. Woodward, Charlottesville, Va., Recurrent Nerve Paralysis of the Larynx.

TEXAS

Nontechnical Educational Program.—The Dallas County Medical Society initiated a new educational program for membership applicants with the purpose to prepare aspiring doctors for their nontechnical responsibilities to patients, the public and the profession. A series of three monthly lectures are to be given on the first Tuesday of each month at 7:45 p. m. in Baylor University Hospital Library, Dallas. The first lecture is on medical organization, the second on public relations and ethics, and the third on the legal aspects of medicine. The lectures are sponsored by the society's new preceptorship committee, of which Dr. Curtice Rosser is chairman. The Texas State Medical Association executive council last September recommended the establishment of orientation schools for new doctors in every community. Dallas is reported to be the first in Texas to establish such a school.

Grants to University Medical Branch. — Five grants for research have been made to the University of Texas Medical Branch, Galveston, as follows: Dr. James B. Nail and alumni associates of Wichita Falls have made an initial grant of $500 for the establishment of a research fund for the study of deafness. It is the intention of the alumni in the Wichita Falls area to maintain this fund by annual grants. J. B. Roerig and Company, Chicago, have granted $2,500 to the Tissue Culture Laboratory for research on factors involved in cellular growth. The National Foundation for Infantile Paralysis has granted $11,675 to support a study to develop a practical serologic test for the diagnosis of poliomyelitis. The Smith, Kline and French

Laboratories, Philadelphia, have made a two year grant of $6,000 for the support of pharmacologic studies of new compounds. Mr. Meyer and Mr. Jerome Epstein, San Antonio, have given a grant of $5,000 for the purpose of establishing the Leib Epstein Medical Student Loan Fund.

WISCONSIN

Memorial Fund.—Friends of Dr. William J. Bleckwenn, professor of neuropsychiatry, University of Wisconsin Medical School, Madison, Mrs. Bleckwenn and classmates have established a memorial fund for William J. Bleckwenn Jr., who died suddenly at the University of Wisconsin, where he was president of the third year class in the medical school. Contributions to the William J. Bleckwenn Jr. Memorial Fund may be sent to Dr. William S. Middleton, Dean of the Medical School, University of Wisconsin, 418 North Randall Avenue, Madison 6.

Dr. Waters Honored.—Dr. Ralph M. Waters, professor of anesthesia at the University of Wisconsin Medical School, Madison, and director of the department of anesthesia at the State of Wisconsin General Hospital, Madison, was awarded the Order of the Vasa from the king of Sweden March 17. The award was presented by Gösta Oldenburg, Swedish consul-general in Chicago, in recognition of the physician's wartime work in training Swedish doctors in anesthesia. The Swedish government has sent four physicians to the State of Wisconsin General Hospital for training under Dr. Waters. The Order of Vasa has been conferred since 1772 for service in science, literature and the arts.

State Board Appointments.—Drs. Forrester Raine, Milwaukee, and Samuel L. Henke, Eau Claire, have been appointed to the state board of health. Dr. Raine, a graduate of Boston University School of Medicine, was in practice in Milwaukee before entering military service as chief of surgical service at Camp Grant and later as surgical consultant in the Central Pacific area. Dr. Henke, who before his appointment practiced dermatology and syphilology and was a staff member of Luther and Sacred Heart hospitals, Eau Claire, is a graduate of the University of Wisconsin Medical School. In 1943 he became an officer in the Naval Medical Reserve Corps, serving at the Farragut, Idaho, naval base and in Hawaii.

PUERTO RICO

International Health Congress.—Puerto Rico was represented at two international health conferences held in Caracas, Venezuela, recently in the person of Dr. Juan A. Pons, San Juan, new commissioner of health in the insular government. Dr. Pons was a member of the U. S. delegation to the twelfth Pan American Sanitary Conference and second Pan American Sanitary Education Conference when those congresses convened.

Central Laboratory at Rio Piedras.—A central laboratory to serve all agencies of the Puerto Rican government is to be built at Rio Piedras, home of the University of Puerto Rico, with plans calling for construction early in 1948. The laboratory will be operated by the Puerto Rico Department of Health, but its facilities will enable it to conduct research on behalf of government agencies with widely diversified functions, according to officials of the department of health in San Juan.

Social Work Convention Held in San Juan.—Under the auspices of the Association of Social Workers of Puerto Rico, a convention was held at Rio Piedras, March 21-23. The causes and cure of delinquency were the chief topics of discussion. Other individuals and organizations interested in delinquency problems in Puerto Rico participated in the discussions. Dr. Angel D. Marchand, San Juan, assistant commissioner of health of Puerto Rico, was elected president of the association for 1947.

Recommend Social Security.—Puerto Rico has adopted local legislation and procedures which would facilitate extension of the Social Security Laws of the United States to this territory, and the U. S. Federal Security Agency has recommended to Congress that certain titles of the Federal Security Law be extended to persons in Puerto Rico who now lack the protection afforded by this law. Among the beneficiaries of this action would be the blind, the aged and dependent children.

Survey of Medical History.—Dr. Manuel Quevedo-Baez, San Juan, Puerto Rican physician and writer, and other members of the medical association of this island have cooperated in the publication of a comprehensive survey of medicine and surgery in Puerto Rico. This publication is in Spanish and covers the first volume of a series tracing medical progress on the island.

GENERAL

Science Editor Dies.—Willard L. Valentine, Ph.D., editor of *Science* magazine and chairman of the Department of Psychology at Northwestern University from 1940 to 1945, died at his home in Alexandria, Va., April 5, aged 42.

Student Loan Fund in Gynecology.—The Woman's Auxiliary of the Southern Medical Association has established the Jane Todd Crawford Student Loan Fund in gynecology for young Southern physicians. The student must be not over 32, must be of good character and must show evidence of good scholarship. The loan is to be returned in small instalments after completion of study. Inquiries may be addressed to Mrs. J. Ullman Reaves, 1862 Government Street, Mobile 18, Ala.

Symposium on Heredity.—The International and Spanish Speaking Association of Physicians, Dentists and Pharmacists held a symposium on Heredity in Genetic Diseases March 31 in New York. Dr. Bernhard Zondek, Jerusalem, Palestine; Clara J. Lynch, Ph.D., Rockefeller Institute, New York; Dr. Otto Marburg, Vienna University; Dr. George W. Henry, Cornell University Medical College, New York; Myron Gordon, Ph.D., New York; Dr. A. J. Blumgarten, chief endocrinologist, Lenox Hill Hospital, New York; G. Lawton, New York, and Dr. Hyman Chartock, New York, participated.

Meeting of Council of New England Medical Societies.—The second annual meeting of the Council of the New England State Medical Societies was held at the Harvard Club, Boston, April 16. Following the business meeting the group was addressed by Drs. Norman H. Gardner, East Hampton, Conn., on "State Planning for Rural Medical Services"; Reginald F. DeWitt and Lyall H. Middleton, Plymouth, N. H., "Group Practice in the Small Community," and Mr. Ambrose B. Kelly, associate general counsel of the Association of Factory Mutual Fire Insurance Companies, "Approaches to the National Health Question."

Educational Program on Mental Health.—An expanded program of public education on the problems and needs of mental patients will be undertaken by the National Mental Health Foundation through grants of $25,000 each from the Carnegie Corporation of New York and the Rockefeller Foundation. Additional grants of $25,000 each have been promised in 1948 from the Carnegie and Rockefeller funds, provided the National Mental Health Foundation can raise $122,000 through popular subscription. The foundation publishes pamphlets and training material for mental hospital personnel and produces radio programs designed to create a wider understanding of mental health problems.

Fellowships in Ophthalmology.—The Heed Ophthalmology Foundation for training eye surgeons after they have finished residencies has recently been established by Mr. and Mrs. Thomas Heed, Evanston, Ill., by a fund sufficient to support up to three fellowships each amounting to $2,500 to $3,000. They are available to citizens of the United States. A board of five ophthalmologists representing medical schools throughout the country will handle the fellowships. Application blanks and additional information may be obtained from the secretary of the board of directors, Dr. M. Hayward Post, 520 Metropolitan Building, 508 North Grand Boulevard, St. Louis 3.

Fraudulent Salesman.—A man calling himself E. G. King recently came to the office of a physician in Malden, Mo., as a salesman of a portable obstetrics table. A special discount for cash brought the cost to $70, which the physician paid by check. King claimed to be representing the Wonder Stretcher Bed Company of Mankato, Minn. After several weeks the table had not arrived and the physician wrote the company. Later he received an unsigned note saying that no such company existed. This person was 5 feet 5 inches tall, weighed 150 pounds and had light brown hair and regular features. The victim believes that the man had visited numerous other physicians in Missouri.

Society for Study of Arthritis.—The American Anti-Arthritis Association, incorporated in California last September, maintains offices in the Los Angeles County Medical Building, 1925 Wilshire Boulevard, Los Angeles. Its purposes are to unite scientific men and women in a broad program of education for the control of arthritis; the development of a more complete understanding of the disease and new technics of prevention and therapy; to promote and engage in research in arthritis and related fields; to operate with other agencies in carrying on its purposes, and to secure funds for carrying out its projects. Drs. Bernard L. Wyatt, Los Angeles, is president; John V. Barrow, Los Angeles, vice president, and Robert T. Pottenger, Pasadena, Calif., secretary-treasurer.

International Congress of Military Medicine.—The eleventh International Congress of Military Medicine and Pharmacy is scheduled to be held in Berne, Switzerland, June 2-7, for the first time since 1939. This organization was founded soon after World War I by a group of consulting surgeons with the Allied armies. Distinguished officers of various countries have served as president, the present incumbent being Major Gen. Charles R. Reynolds, retired, former Surgeon General of the U. S. Army. The International Committee, which activates the organization between sessions, has submitted the following questions for study and report at the meeting in June: 1. Methods of reviving the wounded (reporting countries Great Britain, France and Yugoslavia). 2. General account of modern methods of preventing epidemic diseases in armies (reporting countries United States, Switzerland and Great Britain). 3. Modern methods of evacuating sick and wounded; indications and contraindications (reporting countries Canada, Russia and Poland). 4. Role played by military medicine in the moral and the physical development of the soldier (reporting countries Belgium, France and Switzerland). 5. Comparative study of methods and devices to determine the concentration of hydrogen ions with a view to their use in military pharmaceutical laboratories (reporting countries Switzerland, France and Brazil). The International Committee of Military Medicine and Pharmacy has been cooperating with the International Committee of the Red Cross concerning the revision of the conventions of Geneva and of The Hague. The committee has put forth recommendations on this subject which were considered at the meeting of governmental experts of the International Committee of the Red Cross in Geneva in March. The president of the International Committee of Military Medicine and Pharmacy is General Reynolds and the secretary general is Surgeon Major General J. Voncken of Liége, Belgium.

Grants for Cancer Research.—The Jane Coffin Childs Memorial Fund for Medical Research, New Haven, Conn., has announced appropriations made by its board of managers on Nov. 15, 1946 and Feb. 21, 1947, totaling $202,616.66 for support of cancer research projects and fellowships. Grants of over $10,000 were made to:

Dr. Francisco Duran-Reynals, associate professor of bacteriology, Yale University School of Medicine, New Haven, $49,500 for three years for continued study of the factor influencing carcinogenesis by chemicals.

Leonell C. Strong, Ph.D., associate professor of anatomy, Yale University School of Medicine, $41,290 for three years for continued genetic investigations of cancer.

Dr. William U. Gardner, Ph.D., professor of anatomy, Yale University School of Medicine, $16,500 for three years for continued investigations of the role of hormones in normal and abnormal growth.

Dr. John G. Kidd, professor of pathology, Cornell University Medical College, New York, $14,580 for three years for continued study of viruses and cancer.

Dr. David A. Karnofsky, fellow, $13,500, for three years to work with Dr. Cornelius P. Rhoads at Memorial Hospital and the Sloan-Kettering Institute for Cancer Research.

Dr. Rhoads, director, and his associates at Memorial Hospital and Sloan-Kettering Institute for Cancer Research, $10,000 for one year for continued chemical and metabolic studies of cancer, with special reference to steroids.

An allocation of $10,000 for one year to be used for expenses of conferences, lectures, consultants and travel of investigators receiving grants from the fund.

Allocation of UNRRA Funds.—The United Nations Relief and Rehabilitation Administration recently transferred one and a half million dollars to the World Health Organization Interim Commission for partial continuation of UNRRA's health programs in certain countries. A subcommittee of the World Health Organization Committee on Administration and Finance, under the chairmanship of Dr. C. Vandenberg of the Netherlands, met in February in Geneva to study reports from countries which have been receiving health assistance from UNRRA. Provisional allocations were made, *inter alia*, for a number of purposes, including the teaching program in China and such field activities as the continuation of the basic health program in Ethiopia and malaria and tuberculosis control programs in Greece. Allocations were made also for fellowships in eight countries and for visiting lectureships, for supplying medical literature in various countries and for contributions to the salaries of specialists stationed in the New York and Geneva offices of the World Health Organization Interim Commission. Among those attending the Geneva meeting was Dr. H. van Zile Hyde, Bethesda, Md., of the U. S. Public Health Service. The Interim Commission met in Geneva again March 31. Medical and health leaders from all parts of the world, some 100 in all, attended. Among the organizations which sent observers to the meeting were the United Nations Educational, Scientific and Cultural Organization, the Social Affairs Department of the United Nations, the Food and Agriculture Organization, the International Refugee Organization, the International Children's Emergency Fund, the International Labor Organization and the Provisional International Civil Aviation Organization. The chairman of the Interim Commission, which is composed of eighteen member states, is Dr. Andrija Stampar, former vice chairman of the Economic and Social Council of the United Nations. The director of the Interim Commission headquarters office, 350 Fifth Avenue, New York, is Dr. Frank A. Calderone.

PHILIPPINE ISLANDS

The Philippine College of Surgeons.—The first issue (July-August 1946) of the *Philippine Journal of Surgery*, official organ of the Philippine College of Surgeons, reviews the establishment of the college in 1936 by the late Professor Gregorio Singian at a meeting in the old San Juan de Dios Hospital, of which he was director for many years. The last prewar meeting of the board of regents was held Aug. 29, 1941. During the Japanese occupation the Philippine College of Surgeons suffered the loss of its fiscal assets and many of its records as part of the ravages of the war; it resumed its meetings a few months after American troops drove the Japanese out. Even during these trying years many surgeons, whose ambition it was to become members of the college, kept records of surgical operations, a requirement of applicants, some of them doing so under great hardships. The purposes of the college are the elevation of standards of medical education and practice and the promotion of surgical science and art.

CANADA

National Cancer Institute.—A National Cancer Institute to coordinate all Canadian cancer control work was launched at a two day conference in Ottawa in January. One immediate objective will be the enlistment of every physician in the preparation of careful case records. Physicians will be urged to submit to the institute every possible angle of attack to further cancer control. An interim committee was appointed to proceed in dealing with grants and research projects while the National Cancer Institute is being legally incorporated. The chairman of the committee is Dr. Allan W. Blair, Regina, Sask. Dr. John L. Little, Guelph, Ont., is serving as executive secretary, with headquarters at the Jackson Building, Ottawa.

FOREIGN

Medical Science Center in Rome.—The Italo-American Center for Medical Science has been established in Rome, Italy, for the purpose of renewing cultural exchanges between Italy and the United States interrupted by the war. The center has been authorized by the Italian foreign office. The president is the minister of education, the vice president is the president of the American Relief of Italy and among the directors are the rector of the University of Rome, three professors and a representative of the foreign office. The address of the center is Via Torino, 122, Rome, Italy.

CORRECTION

Rickettsialpox.—In the article by this title in THE JOURNAL, March 29, page 905, second column, line 20, the word "lymphocytes" should have read "lymph vessels."

Marriages

ALLISON MONDOVILLE ALDERMAN JR., Wilmington, N. C., to Miss Willie Ruth Edwards of Winston-Salem Dec. 16, 1946.

CARVEL M. JAMES, Beverly Hills, Calif., to Miss Norma Talmadge in Las Vegas, Nev., Dec. 4, 1946.

ALOYSIUS PATRICK HARNEY, New Bedford, Mass., to Miss Nina Louise Parker of Boston Dec. 28, 1946.

ANDY HALL JR., St. Louis, to Mrs. Martha Eileen Sanderson of St. Paul in November 1946.

ABRAHAM A. GOETZ, Baltimore, to Miss Natalie Wolf of Yonkers, N. Y., March 9.

DANIEL K. ADLER to Miss Rosamond Small, both of Syracuse, N. Y., February 16.

MARTIN ACKERMAN to Miss Lucille Diamond, both of New York, March 16.

ROBERT E. BODWIN to Miss Leona Corthier, both of Chicago, recently.

Deaths

George P. Muller ✦ Philadelphia; born in Philadelphia, June 29, 1877; University of Pennsylvania Department of Medicine, Philadelphia, 1899; Grace Revere Osler professor of surgery at Jefferson Medical College of Philadelphia from 1939 to 1946, when he became professor emeritus of surgery; formerly professor of clinical surgery at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, and his alma mater; member of the founders group of the American Board of Surgery; fellow, member of the board of regents and past president of the American College of Surgeons; past president of the Philadelphia County Medical Society, Philadelphia Academy of Surgery, College of Physicians of Philadelphia and the American Association for Thoracic Surgery; member of the American Surgical Association and the Society of Clinical Surgery; served during World War I; served on the staffs of the White Haven (Pa.) Sanatorium, Rush Hospital for Consumption and Allied Diseases, Lankenau, Jefferson and Misericordia hospitals; received honorary degrees from the Villanova (Pa.) College in 1916 and the Muhlenberg College in Allentown, Pa., in 1937; on the editorial board of *Annals of Surgery;* died in Margate, N. J., February 18, aged 69, of cerebral thrombosis.

Earl Calvin Padgett ✦ Kansas City, Mo.; born in Greenleaf, Kan., July 8, 1893; Washington University School of Medicine, St. Louis, 1918; professor of clinical surgery at the University of Kansas School of Medicine; professor of oral surgery and maxillofacial surgery at the Kansas City Western Dental College; diplomate of the National Board of Medical Examiners; member of the founders group of the American Board of Surgery; specialist certified by the American Board of Plastic Surgery; member of the American Surgical Association, Western Surgical Association and the American Association for the Surgery of Trauma; fellow of the American College of Surgeons; served in France during World War I; on the staffs of the Children's Mercy Hospital, Kansas City General Hospital, Kansas University Hospitals, Menorah Hospital and Providence Hospital, all of Kansas City, Kan., St. Mary's and St. Luke's hospitals; died Dec. 2, 1946, aged 53, of lobar pneumonia.

William Barnett Owen ✦ Louisville, Ky.; born in Hart County, Ky., March 12, 1880; Kentucky University Medical Department, Louisville, 1903; clinical professor and head of the department of orthopedic surgery at the University of Louisville School of Medicine; chairman, Section on Orthopedic Surgery, American Medical Association, 1932-1933; specialist certified by the American Board of Orthopaedic Surgery; past president of the Clinical Orthopedic Society; member of the American Orthopaedic Association, Southern Surgical Association, Southeastern Surgical Association and the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons, formerly affiliated with the U. S. Public Health Service; chairman of the staff of Kosair Crippled Children's Hospital; on the staffs of the Children's, St. Joseph and Kentucky Baptist hospitals and Norton Infirmary; died February 23, aged 66, of carcinoma of the stomach.

Victor Robinson, New York; born in Russia on Aug. 16, 1886; Chicago College of Medicine and Surgery, 1917; also a graduate in pharmacy; professor of the history of medicine at the Temple University School of Medicine, Philadelphia; served as president of the New York Society for Medical History; founding member of the History of Science Society; an official delegate to the International Congress of the History of American Medicine, Leyden-Amsterdam, Netherlands, in 1927; a council member of the American Association of the History of Medicine from 1939 to 1941; fellow of the New York Academy of Medicine and chairman of its section on history and cultural medicine, 1944-1945; member of the Institute of Aeronautical Sciences; editor of the Pagel-Sudhoff Handbook of the History of Medicine and author of "Pathfinders in Medicine" and numerous other works; died January 8, aged 60, of coronary thrombosis.

Franklin Fayette Lane ✦ Captain (MC), U. S. Navy, retired, Philadelphia; born in Elm, N. J., on Aug. 21, 1888; University of Pennsylvania School of Medicine, Philadelphia, 1915; member of the Medical Society of the State of Pennsylvania and the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Ophthalmology and American Board of Otolaryngology; fellow of the American College of Surgeons; entered the medical corps of the U. S. Navy as a lieutenant (jg) in 1917; placed on the retired list January 1 after having served actively for about twenty-nine and one-half years; served as a member of the Naval Retiring Board, Navy Department in Washington, D. C.; died January 29, aged 58, of aneurysm of the aorta.

Lee Welsey Pollock ✦ Rochester, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1912; entered the Mayo Clinic as a member of the clinical staff in November 1914, appointed associate in medicine, and in April 1925 appointed head of a section in medicine; assistant professor of medicine at the Mayo Foundation; during World War I was a first lieutenant in the medical corps of the U. S. Army and served on the board of examiners for tuberculosis in various army camps; affiliated with St. Mary's Hospital, Colonial Hospital, Worrall Hospital and the Kahler Hospital, where he died February 2, aged 58, of left hemiplegia and pulmonary embolism.

Howard Gustav Schleiter ✦ Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1905; associate professor emeritus of medicine at the University of Pittsburgh School of Medicine; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; member of the American Clinical and Climatological Association; served in France during World War I; consultant at the Pittsburgh Diagnostic Center; on the staffs of the St. Francis Hospital and the Allegheny General Hospital, where he died February 5, aged 66, of hemorrhage due to peptic ulcer.

Charles Henry Hare ✦ Boston; Harvard Medical School, Boston, 1889; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; member of the Boston Society for Medical Improvement and the Boston Obstetrical Society; at one time instructor in gynecology at Harvard Medical School, Courses for Graduates, and on the faculty and dean of the Boston Polyclinic; served on the staffs of the City Hospital in Quincy, Mass., Boston Dispensary, Carney Hospital and St. Elizabeth's Hospital; died January 21, aged 84.

Joseph Albert Abercrombie ✦ Richlands, Va.; Johns Hopkins University School of Medicine, Baltimore, 1930; served an internship and residency at Johns Hopkins Hospital in Baltimore; member of the state board of health; consultant on the Selective Service Board during World War II; on the staffs of the Grundy (Va.) Hospital and Mattie Williams Hospital; died January 12, aged 40, of cerebral hemorrhage.

Harold Edwin Andrews, Buffalo; Boston University School of Medicine, 1925; member of the American Medical Association; served during World War II; died January 21, aged 48, of coronary thrombosis.

Edna Blanche Averill, Springfield, Mass.; Boston University School of Medicine, 1910; died Dec. 25, 1946, aged 76, of bronchopneumonia.

William Thomas Baker ✦ Louisville, Ky.; Hospital College of Medicine, Louisville, 1892; died in the Jackson Memorial Hospital, Miami, Fla., January 28, aged 76, of injuries received when struck by an automobile.

Cecil Ernest Barnett ✦ Kirkwood, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1917; died in St. Mary's Hospital, Clayton, Dec. 23, 1946, aged 54, of coronary thrombosis.

Frederick James Bentley ✦ Seattle; Rush Medical College, Chicago, 1901; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Oto-Laryngology and the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; member of the staffs of the Children's Orthopedic and King County hospitals; died January 1, aged 71, of coronary embolism.

Francis Stephen Caldicott, Lowell, Mass.; Tufts College Medical School, Boston, 1913; member of the American Medical Association; served during World War I; designated examiner for the U. S. Veterans Administration; on the courtesy staffs of St. Joseph Hospital, St. John's Hospital and the Lowell General Hospital, where he died January 17, aged 57, of coronary thrombosis.

Benjamin Franklin Campbell ✦ Burlington, Iowa; College of Physicians and Surgeons, Keokuk, 1897; Northwestern University Medical School, Chicago, 1904; died Dec. 31, 1946, aged 72, of hypertensive cardiovascular disease.

George Ralph Christie, Long Prairie, Minn.; Rush Medical College, Chicago, 1882; member of the American Medical Association; formerly mayor and president of the school board; died in the Asbury Hospital, Minneapolis, January 20, aged 89, of pneumonia following an operation.

Thomas Francis Coughlin Jr., Hoboken, N. J.; University of Tennessee College of Medicine, Memphis, 1917; served during World War I; on the staffs of the North Hudson Hospital, Weehawken and St. Mary's Hospital, where he died January 5, aged 63, of heart disease.

Frank Leander Crikelair, Green Bay, Wis.; Milwaukee Medical College, 1908; member of the American Medical Association; past president of the Brown-Kewaunee-Door Counties Medical Society; served during World War I; died January 13, aged 62, of coronary occlusion.

Matthias James Crowe, St. Louis; St. Louis University School of Medicine, 1927; served on the staff of the Christian Hospital, where he died January 17, aged 42, of cirrhosis of the liver and splenomegaly.

William Elton Day, Clarksville, Iowa; State University of Iowa College of Medicine, Iowa City, 1902; member of the American Medical Association; died January 9, aged 72, of coronary thrombosis.

Charles Edward Fisher, Lyons, Kan.; Northwestern University Medical School, Chicago, 1903; served as secretary of the Rice County Medical Society; affiliated with the Lyons Hospital, where he died January 19, aged 69, of heart disease.

William Dabney Gholston, Danielsville, Ga.; University of Georgia Medical Department, Augusta, 1900; member of the American Medical Association; secretary of the Tenth District Medical Society; past president of the Clarke-Madison-Oconee Counties Medical Society; formerly member of the state general assembly; died in Athens Dec. 18, 1946, aged 76, of cerebral hemorrhage.

George Henry Goode, Pittsburgh; Miami Medical College, Cincinnati, 1883; died Dec. 22, 1946, aged 85, of arteriosclerotic heart disease.

Herbert Lewis Johnson, Hadley, Mass.; Medical School of Maine, Portland, 1884; member of the American Medical Association; died Dec. 22, 1946, aged 87, of uremia.

Isaac William Jones ✠ Los Angeles; Kentucky School of Medicine, Louisville, 1904; died Dec. 23, 1946, aged 70, of coronary arteriosclerosis.

Edward James Kendall, Detroit; Hahnemann Medical College and Hospital of Philadelphia, 1895; for many years on the staff of the Grace Hospital; formerly member of the city board of health; died January 10, aged 86, of carcinoma of the rectum.

Herman Kessler, Hatboro, Pa.; Hahnemann Medical College and Hospital, Philadelphia, 1939; member of the American Medical Association; received a military award for his work in the Selective Service System; died in the Jefferson Hospital, Philadelphia, January 10, aged 37, of carcinomatosis.

Herschel W. Lancaster ✠ Nevada, Mo.; Beaumont Hospital Medical College, St. Louis, 1892; an Affiliate Fellow of the American Medical Association; on the staff of the Nevada Hospital; died January 17, aged 84, of chronic valvular heart disease.

Robert Edwin McBride ✠ Las Cruces, N. M.; Medical Department of Tulane University of Louisiana, New Orleans, 1896; fellow of the American College of Physicians; at one time secretary of the New Mexico Medical Society and the Dona Ana County Medical Society; served as superintendent of the county school system, member of the school board, county health officer and local surgeon for the Atchison, Topeka and Santa Fe Railroad; director of the Bowman Bank; died January 17, aged 73, of cerebral hemorrhage.

William Smith McFarland, Zanesville, Ohio; College of Physicians and Surgeons, Baltimore, 1886; died recently aged 83.

Walter Wyatt McKay ✠ Warren, Ohio; Western Reserve University Medical Department, Cleveland, 1910; fellow of the American College of Surgeons; past president of the Trumbull County Medical Society; member and past president of the staff of the Warren City Hospital; died recently, aged 65, of coronary thrombosis.

Olin Burr Martin, Williamsburg, Ohio; Ohio Medical University, Columbus, 1903; died recently in the Christ Hospital, Cincinnati, aged 67, of thrombosis.

Frank Leslie Matousek, Cicero, Ill.; Rush Medical College, Chicago, 1938; member of the American Medical Association; interned at the Chicago Memorial Hospital; served as a captain in the medical corps, Army of the United States, during World War II; died in Marshfield, Wis., Sept. 15, 1946, aged 42, of Addison's disease.

Charles Everett Nicholson, Pittston, Pa.; Medico-Chirurgical College of Philadelphia, 1915; member of the American Medical Association; served in France during World War I; on the staff of the Pittston Hospital; died January 19, aged 59, of coronary thrombosis.

William Ernest Oglesbee, Harveysburg, Ohio; Medical of Ohio, Cincinnati, 1890; died recently, aged 79.

Byron Palmer, Santa Monica, Calif.; Starling Medical Colllege, Columbus, 1900; served during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty, died recently, aged 71, of coronary thrombosis.

John Samuel Phelps, Lynn, Mass.; Harvard Medical School, Boston, 1893; member of the American Medical Association; formerly medical director of the Columbian National Life Insurance Company; died Dec. 3, 1946, aged 80, of coronary occlusion.

Edward Reuben Prigger ✠ Penns Grove, N. J.; Jefferson Medical College of Philadelphia, 1910; died Dec. 27, 1946, aged 57, of coronary thrombosis.

Edwin Almiron Riley ✠ Park Falls, Wis.; Rush Medical College, Chicago, 1897; served during World War I; affiliated with the Park Falls Hospital; died January 21, aged 75, of carcinoma.

Amos Sherbon, Central City, Iowa; State University of Iowa College of Medicine, Iowa City, 1910; died in St. Luke's Hospital, Cedar Rapids, Dec. 27, 1946, aged 73, of thrombosis of the common iliac artery.

Frederick Joshua Simmonds ✠ Boston; Middlesex College of Medicine and Surgery, Cambridge, 1917; died in the U. S. Naval Hospital, Chelsea, Dec. 6, 1946, aged 68, of cerebral thrombosis.

Allen Walters Sivyer, Milwaukee; University of Pennsylvania School of Medicine, Philadelphia, 1915; life member of the Milwaukee Academy of Medicine; for many years assistant medical director of the North Western Mutual Life Insurance Company; served in France during World War I; died in the Columbia Hospital Dec. 10, 1946, aged 55, of coronary thrombosis, old hemiplegia and arterial hypertension.

Eugene Albert Smith, Wauwatosa, Wis.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; served as assistant clinical professor of surgery at the Marquette University School of Medicine, Milwaukee; veteran of the Spanish-American War and World War I; at one time physician at the state prison in Waupun; retired superintendent and clinical director of the Milwaukee County Dispensary-Emergency Unit; died Dec. 1, 1946, aged 76, of leukemia and heart disease.

Marshall Bruce Stewart, Dormansville, N. Y.; Temple University School of Medicine, Philadelphia, 1932; member of the American Medical Association and the Michigan State Medical Society; began active duty as a captain, medical corps, Army of the United States, in 1941; service terminated with rank of major in September 1945; died Dec. 3, 1945, aged 53, of cancer of the pancreas.

George Lyman Taylor, Warwick, Mass.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1885; died in Northfield Dec. 4, 1946, aged 85, of cerebral hemorrhage.

William Flint Tidwell, Pittsburg, Ill.; St. Louis College of Physicians and Surgeons, 1901; died January 17, aged 67.

John Metcalf Trible ✠ Houston, Texas; St. Louis University School of Medicine, 1907; professor of urology and chairman of the department at Baylor University College of Medicine; past president of the Harris County Medical Society; served in France during World War I and later with the Army of Occupation; served at one time as chief of staff at Memorial Hospital, and was on the staffs of the Jefferson Davis, City-County and Methodists hospitals and St. Joseph's Hospital, where he died January 20, aged 62, of coronary occlusion.

DIED WHILE IN MILITARY SERVICE

Donald Richard McKay, Fargo, N. D.; Northwestern University Medical School, Chicago, 1941; served an internship at the Ancker Hospital in St. Paul and a residency at the St. John's Hospital in Fargo; began active duty as a lieutenant (jg) in the medical corps, U. S. Naval Reserve, on Nov. 9, 1942; promoted to lieutenant; killed in an explosion on the U. S. S. *Mount Hood* at Manus Island in the South Pacific Nov. 10, 1944, aged 30.

Thomas Gervase Walsh ✠ Chicago; Rush Medical College, Chicago, 1923; served as associate professor of medicine at the University of Illinois College of Medicine; formerly on the faculty of his alma mater; interned at the Cook County and Mercy hospitals; a captain in the medical corps of the U. S. Naval Reserve and affiliated with the Naval Hospital at San Diego during World War II; served for two years in the Pacific theater; died Nov. 4, 1946 while on special leave, aged 50, of heart disease.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 8, 1947.

The Results of Prefrontal Leukotomy

The operation of prefrontal leukotomy was introduced by Moniz of Lisbon in 1935 for the treatment of certain forms of mental disease. The idea was to break the connection between the patient's thoughts and his emotions, thus relieving mental tension. The frontothalamic tract, which connects the prefrontal area with the thalamus, is divided with this object. It is now possible to assesss the results in a large number of cases treated in this country. In 1935 the Board of Control (which controls the administration of all mental institutions) started an inquiry into the results in 1,000 cases. The operative risks include death from hemorrhage (19 cases in the series) or from a complication such as bronchopneumonia (4 cases), meningitis (3 cases), cerebral abscess, respiratory failure, subdural hematoma or empyema (of each 1 case), development of epileptiform fits or other postoperative symptoms, and changes of personality. The surgeon cannot be certain of cutting the frontothalamic fibers. In a case recorded by A. Meyer a schizophrenic patient did extremely well, becoming happy and unworried. But when he died of cancer of the esophagus eighteen months later necropsy showed that the frontothalamic fibers had not been cut and the nucleus medialis dorsalis had not degenerated. Hence it is suggested that damage anywhere in the brain may have a beneficial effect in some of the cases.

Of the 1,000 cases 348 occurred in males and 652 in females. For statistical purposes the cases were grouped under the diagnoses of schizophrenia; manic-depressive insanity; neurosis (*a*) obsessional, (*b*) other; postencephalitic states; mental defect; epilepsy; various. Patients discharged recovered amounted to 24.8 per cent and improved to 10.5 per cent making together 35.3 per cent of the patients treated. Of these 9.3 per cent relapsed. Only 1 per cent were made worse by the operation; 24.7 per cent remained in the hospital unchanged. Of 6 per cent who died only half did so as a result of the operation; in 19 of these hemorrhage was the cause. Fits after the operation were reported in 3.3 per cent; only in 2.1 per cent was there more than one fit. For the schizophrenic patients treated there was a discharge rate—recovered or improved—of 23 per cent, excluding those who relapsed. For the manic-depressive patients the discharge rate was fifty per cent.

The board concludes that prefrontal leukotomy is usually a simple operation for the patient, if not always easy for the surgeon. Complications are rare, and the death rate cannot be said to be high when the seriousness of the established mental disorder is taken into account. Remarkable improvement in mental behavior follows in a large percentage of patients who have had severe symptoms with poor prognosis and have failed to respond to other treatment. Many are discharged from the hospital and others have become more placid and easier to nurse. The operation should be done only after each case has been carefully considered by experienced psychiatrists.

Tests With Streptomycin

The Ministry of Health reports that clinical tests are being carried out with the American drug streptomycin by the Medical Research Council. Until they are completed it is not possible to assess the value claimed for the drug and to determine the best methods of use. The latest American opinion indicates that its value in tuberculosis is still unproved. The minister of health does not wish to hamper individual doctors and hospitals in their endeavors to obtain any new drugs which they consider may benefit their patients, but it must be emphasized that streptomycin is potentially dangerous and may have serious ill effects, including permanent giddiness and deafness. The minister states that not enough is known about the drug at present to justify action by the government to make it more freely available. For instance in a very small number of patients with tuberculous meningitis whose life has been prolonged by this treatment there has been nearly always permanent serious mental derangement, blindness or deafness. Steps are being taken to accelerate production in this country so that supplies may be available if the clinical trials are favorable.

Research in Geriatrics

The trustees of the Nuffield Foundation have offered the University of Cambridge the sum of $80,000, with a possible further $72,000, for research under Professor F. C. Bartlett at the psychologic laboratory into the causes and results of aging, with particular reference to adults and to the characteristics and changes of human function associated with different age groups. It is proposed that the gift shall include $8,000 for capital outlay, with a further $2,400 a year for three years and a possible renewal for another three years.

PARIS

(From Our Regular Correspondent)

March 26, 1947.

Doctors and Old Age Insurance

The extension, starting with old age insurance, as from the 1st of January of the National Security law to all French citizens and especially to isolated workers and to members of the liberal professions, has aroused reactions among those concerned. The National Council of the Order of Doctors has taken the initiative of convening qualified representatives of all the liberal professions (pharmacists, dentists, midwives, veterinarians, barristers, chartered accountants) in order to reach a similarity of action on this subject. After the delegates of these orders got in touch with the Social Security Fund, the director of this organization made the statement that the Social Security law must be extended obligatorily to every Frenchman, and no exception for the liberal professions is possible, the import of the law being the national solidarity. On the other hand, he admits professional solidarity and sees no inconvenience in the creation of supplementary autonomous funds to cover the risks of illness, old age and death. The social security organization is considering the abolition in the near future of the limitation of revenue for obtaining the allocation to aged workers, and this would allow everybody to benefit of the old age pension. The president of the National Order of Doctors has already had interviews with the various Medical Mutual Help Societies with a view to promoting a federation of those in order to coordinate their activities.

Miscellaneous

The United States government has granted a certain allocation of streptomycin to the French Ministry for Public Health, which has appointed as treatment centers for Paris the Claude Bernard Hospital, the Hospital for Sick Children and the Trousseau Hospital and for Algiers the Hospital for Infectious Diseases.

Among those who have been elected foreign associates to the Academy of Surgery are Surgeon General Paul R. Hawley; Dr. E. D. Churchill, Boston; Dr. E. A. Graham, St. Louis; Dr. Alfred Blalock, Baltimore; Sir Alfred Webb-Johnson, London; H. W. Bell Cairns, Oxford; J. M. Graham, Edinburgh; A. E. Porrit, London; Walter Rowley Bristow, London; Burdenko, Russia, posthumously; J. J. Djannelidze, Leningrad.

The twenty-sixth French Congress of Medicine will meet in Paris on the 16th, 17th and 18th of October.

MOSCOW

(From Our Regular Correspondent)

March 4, 1947.

The Conservation of Lenin's Body

In 1934 the Soviet government decided to preserve the body of Lenin, leader of the Great October Socialistic Revolution. It was decided to conserve it as it was on the day of Lenin's death on Jan. 21, 1924 and to erect a mausoleum. During the twenty-three years that have passed, about 20,000,000 people from all over the world have visited the mausoleum, now a national shrine of the Soviet Union. In 1924 science did not possess perfect methods for durable conservation, methods making possible a long conservation of the body with features unchanged so that they may be observed for centuries. The Egyptian method of embalming results in desiccation of tissues, with a shrinking of internal organs and shriveling of the skin. Thus the resemblance is completely lost. In the early middle ages there were attempts to embalm—for instance King Henry I of England (1135 A. D.) and Pope Alexander Fifth (1410 A. D.). These attempts failed because of numerous changes observed in a short time. The method of injecting of fluids into blood vessels widely used at present in the United States does not guarantee long preservation without change of external features. Aiming to obtain a durable conservation without alternation of features, the late professor of anatomy V. Vorobjev and professor of biochemistry B. Zbarsky used with excellent results the latest scientific discoveries. They were verified many times by special committees. Eminent scientists, members of those committees, Professors Abrikosov (anatomist), Orbelli (physiologist), Burdenko (surgeon) and others stated in their last scientific report that the problem of preserving Lenin's body for a long time was solved with great success. It is believed that the preservation will remain almost indefinitely. A special research laboratory is set up at the mausoleum, where Professor Boris E. Zbarsky continues his work with many collaborators. At present there is no doubt that future generations will be able to see Lenin in his mausoleum appearing as not dead but asleep.

Cytral

Vitamin A has a clearly determined antihistamine effect. Cytral is a "fragment" of vitamin A. It neutralizes the action of 1 Gm. of 1 : 50,000 histamine solution, while vitamin A and β-ionin neutralize it in a 1 : 15,000 solution. Benadryl is a synthetic antihistamine of an anesthetic type. It has a cumulative action which is absent in cytral. Cytral is a yellow oily liquid obtained from the seeds of coriandrum, a plant from the umbrella family. It was tested in the clinic of Professor Mikhail S. Vovsi (Moscow) and in other hospitals for hypertension as an aqueous or aqueous-colloidal solution. The dose varied between 12 and 25 mg. daily. Usually in ten to fourteen days the headache passed, high blood pressure fell and weakness diminished. In the incipient forms of pregnancy toxicoses vomiting and nausea disappeared. Cytral is most effective in keratitis, conjunctivitis and especially in glaucoma. Its positive action was verified by Professor Evgenia A. Kaminskaya-Pavlova of the Moscow Central Institute of Ophthalmology in the name of Helmholtz. Eye drops with cytral diminished pain and intraocular tension.

Soviet Physicians in India

The delegation of Soviet scientists at the thirty-fourth Indian Scientific Congress at Delhi recently returned to Moscow. Soviet medicine was represented by a parasitologist, Academician Evgeni N. Pavlovsky, head of the Tajik branch of the Academy of Sciences of the Soviet Union and by Professor Sultan Umarov, rector of the Central Asia University in Tashkent. They read reports on natural niduses of insect transmitted diseases. After the congress ten foreign scientists, including Academician Pavlovsky, were honored with a degree of doctor *honoris causa*, and they were received by Pandit Nehru, president of the Indian provisory government.

The Death of Professor Herzen

After a serious illness the surgeon Professor Piotr A. Herzen died in Moscow January 2. He was the grandson of the writer Alexander I. Herzen. He graduated at the Basel and Lausanne universities (Switzerland). In czarist Russia, foreign medical diplomas were not valid, and in order to get permission to work in his native Russia P. A. Herzen had to graduate a second time in 1898. Professor Herzen became president of the Moscow Surgical Society and in 1929 was president of the twenty-first All-Union Congress of Surgeons. Professor Herzen published about a hundred scientific works. He is widely known through all the medical world. He proposed fifteen new operative methods and performed himself about 20,000 operations. He was director of the Moscow Neoplasm Treatment Institute. Many of his former pupils are now occupying surgical chairs in the universities of our country. He was decorated by the government with several orders.

ITALY

(From Our Regular Correspondent)

March 17, 1947.

National Neurologic Convention

The first National Neurologic Congress was recently held in Genoa on the initiative of Professor De Lisi, director of the Neurologic Clinic of the University of Genoa. The purpose of the meeting was to give a new life to the Italian Neurologic Association, to define and to prepare the means for the teaching and hospital interests of this specialty, to establish scientific contacts among adepts of this medical branch for the first time since the war and after a long period of silence of the association (inactive for practically fourteen years). Two hundred scientific communications were presented in the program of the convention. The three chief groups of problems discussed were (1) physicochemical phenomena of transmission of nervous impulse, (2) diagnosis and treatment of herniated intervertebral disk and (3) symptomatology and etiology of arachnitis. Professor Spadolini of the University of Pisa read a paper on the changes effected by the action of the chemical mediators on the visceral effectors. Professor Visintini of Turin presented a critical review of the chemical concept of the mediation of acetylcholine in the transmission of nervous excitation. Professor Delitala of the University of Bologna told of his experience with more than 300 laminectomies performed for hernia of the intervertebral disk. Among all the mechanical changes which may cause sciatalgia of surgical type, hernia of the disk may most easily be demonstrated. In performing laminectomy a projection may be observed which reminds one of the nodes of the fingers; after the incision of the posterior ligament there appears white chafed tissue. After the removal of the herniated tissue the nerve root, which appears edematous and stretched, resumes its normal position. Dr. Bonola of Bologna concluded from x-ray examinations of the spinal cord and from myeloscopy carried out as an aid to the diagnosis of the localization of the posterior hernia of intervertebral disk that such investigation may furnish important elements to demonstrate the presence and the seat of the hernia and may confirm the facts furnished by neurologic examination. Myeloscopy was carried out by means of a board which may suitably be dipped and which has been designed by the Instituto Rizzoli di Bologna. Professor Neri of Bologna illustrated the symptomatologic value of the electric exploration of the paravertebral spinal region. In 40 cases of hernia of the disk with symptoms of sciatalgia faradic stimulation revealed intense pain at the level of the disk,

radiating downward with a variable extent of 4 to 8 cm. Electric exploration likewise reveals zones of tabetic and syringomyelic hyperalgesia. Professor Belloni of the University of Padua discussed the roentgenologic diagnosis of encephalic arachnitis and recommended the use of arteriography by the percutaneous route to furnish useful data for the diagnosis of encephalic tumors. Professor Lunedei of the University of Florence presented etiopathologic reports on arachnoiditis and endocraniosis, asserting that the syndrome of Morgagni or of Stewart-Morel (endocraniosis), for which recently the term metabolic craniopathy has been coined by American authors, should be combined in a single morbid group together with chronic primary arachnitis, with some types of essential hemicrania and with some forms of chronic diencephalitis; for this group the term "chronic frontobasilar phlogosis" may be used. Professor Salotti of Siena spoke about roentgenologic symptomatology of chronic meningeal phlogosis and of endocraniosis; based on the x-ray observations three phases of the disease may be distinguished: an initial phase of hypertension and congestion, a second phase with incipient, irreversible changes of the skeleton and of the meninges and a third phase of definite and progressive changes of the skeleton. Encephalography by means of air and particularly cisternography proved to offer great symptomatologic aid to the diagnosis of arachnoiditis. The attendants of the convention voted for the reconstruction of the Italian Association of Neuropathology and Biology of the Nervous System, which should also enlarge its field by caring for the teaching and the hospital and professional interests of members of the specialty.

ANKARA

(From Our Regular Correspondent)

Jan. 15, 1947.

Ninth National Turkish Medical Congress

A national medical congress has been held every two years since 1925. At the fifth congress in 1933 delegates from neighboring countries also attended. Between 1938 and 1943 there was no meeting. At all congresses two topics have predominated, medical matters and those pertaining to health and social assistance. On the agenda have been reports on malaria, trachoma, tuberculosis, syphilis, cancer, scarlet fever, rachitis, rheumatism, influenza, intestinal parasites, toxicomania, eugenics, nutrition, infant mortality, hot springs and sports. Physicians of all organizations, military and civil service, private practitioners, pharmacists, dentists and chemists may attend the meeting. The membership fee is 3 Turkish pounds. Congress publications and proceedings are free of charge. A reduction of 20 per cent on transportation and at hotels is granted members coming from other parts of the country. Every congress is accompanied with an exhibition of domestic and foreign pharmaceutical preparations and public health propaganda. After the congress the health exhibition is open to the public. At the last congress medical and surgical instruments and hospital equipment of domestic origin were on view.

Under the auspices of Ismet Inönü, president of Turkey, and with Recep Peker the prime minister as honorary president, the ninth congress was held from October 21 to 23 and was attended by almost a thousand members from all parts of the country. Two main themes were debated, avitaminosis and health problems in rural communities. After a general discussion on vitamins, (*a*) biology and sources of vitamins in Turkey and (*b*) pathology and diseases of avitaminosis in Turkey in adults, the same subject in relation to children was taken up by Prof. Dr. Ihsan Hilmi Alantar and (*c*) the importance of vitamins in regard to food preparation by Prof. Dr. Burhan Tugan. Papers on rural health problems were read by Prof. Drs. M. Erel and B. F. Ural, the former concerning himself with general and individual measures to be taken in regard to sanitary installations in rural communities and the latter with the necessity for cooperation of government and public in connection with public health problems and health education in rural communities. Almost 80 per cent of Turkey's 20 million inhabitants are living in 40 thousand villages, which shows how urgent is immediate attention. Presentation of papers on the subject gave other members the opportunity of expressing their views, which gave rise to lively discussion. Seventy-three communications on other topics were received.

On the occasion of this congress the second microbiologic and the fifth surgical convention were also held in Ankara. The tenth medical congress is to be held in 1948 and is to last four days. The president is to be the minister of health and social assistance, and the topics will be industrial hygiene, the physician in industry and diseases of the thyroid.

Increase in Specialists

When the regulations pertaining to specialists were published in 1929 general practitioners were also treating diseases that really needed the attention of a specialist. In 1929 a commission of university professors and specialists of the Ministry of Health was appointed by the same ministry to investigate the certificates of all physicians professing to be specialists, obliging those whose certificates were unsatisfactory to undergo another examination before their certificates could be endorsed. Since then the number of specialists has been increasing steadily. Of the more than 5,600 physicians, 491 are specialists in internal medicine, 357 in surgery, 203 in obstetrics and gynecology, 170 in bacteriology, 145 in biochemistry, 144 in ophthalmology, 120 in dermatology and venereal diseases, 105 in pediatrics, 101 in otolaryngology, 94 in psychiatry and nervous diseases, 91 in radiology, 63 in urology, 32 in pathology, 25 in legal medicine and 14 in physical medicine. There are only 12 physicians engaged in hygiene and preventive medicine, which is a comparatively new field in Turkey. Most of these 12 physicians have been in the United States as recipients of the Rockefeller Foundation Fellowships, undergoing a course of training in this important branch.

For years most new graduates have specialized in internal diseases, obstetrics, surgery and pediatrics, while the number of those deciding to specialize in hygiene, bacteriology and research work has greatly decreased. For this reason the Ministry of Health decided to oblige a sufficient number of students who studied at the expense of the government and who graduated with highest marks to specialize in laboratory work at the Central Institute of Hygiene in Ankara. The time spent there in pursuit of these studies will be deducted from the obligatory government service. Most physicians in obligatory government service are employed as health officers in the eastern provinces.

Physicians in the National Assembly

The National Assembly usually opens after October 29, the anniversary of the republic, and terminates in June. If need arises the assembly may be called on to meet at any time.

The seventh assembly was in session till July 1946. So far 4,862 laws have been passed during the twenty-four years. At present there are two medical men in the Council of Ministers; one is Dr. Behcet Uz, the minister of health and social assistance, the other Dr. Sadi Irmak, the minister of labor. The late Dr. Refik Saydam was prime minister from 1939 till 1942. Of the 425 members 44 are physicians, 70 lawyers, 32 economists, 66 military men, 37 business men, 50 farmers, 50 educationalists, 70 administrators, 29 pressmen, 27 financiers, 12 diplomats, 7 dentists, 5 engineers, 2 pharmacists and 2 veterinarians. Of foreign languages spoken by members of the assembly 259 know French, 73 German, 40 English, 39 Arabic, 29 Greek, 22 Persian, 12 Russian, 11 Italian, 5 Armenian, 4 Bulgarian and 1 Spanish.

Correspondence

UROLOGIC COMPLICATIONS

To the Editor:—The terms "tidal drainage" and "tidal irrigation" used in the article "Urologic Complications in Injuries of the Spinal Cord" in THE JOURNAL, February 8, are confusing. As many different designs of tidal drainage apparatus have appeared in the literature, it is not clear which apparatus was on trial or, in fact, whether or not one type of apparatus was used for "tidal drainage" and another for "tidal irrigation."

It is to be expected that hand irrigation would be more effective than the use of the apparatus, because none of the commonly used tidal drainage designs are capable of irrigating the bladder in the usual sense of the term. These devices merely mix fluid very slowly with the urine in the bladder until a predetermined intravesical pressure is reached, at which point they aspirate the mixture. The efficiencies of the various designs vary widely: some of them aspirate quite forcefully for several minutes, and others cease aspirating as soon as the slightest resistance is encountered. Unfortunately, tests of some of the latest designs show that they aspirate very feebly, and they are therefore undependable when viscid material needs to be removed from the bladder.

Regardless of their efficiency, the nearest such apparatus can come to irrigating the bladder is mixing of irrigating fluid with considerable quantities of urine. In order to irrigate the bladder this mixture would have to be removed first, and then more fluid would have to be introduced rapidly into the bladder, to be followed by another aspiration of the bladder contents. In some cases irrigation will need to be multiple for maximum effectiveness, just as is the usual case when hand irrigation is used. By the incorporation of such multiple irrigation cycles into the design of such apparatus, we can be certain that the bladder is completely filled during each irrigation and that the maximum safe intravesical pressure is not exceeded, neither of which criteria is met by the ordinary technics of irrigation with a hand syringe. To my knowledge, only one design so far described is capable of irrigating the bladder in this way. Because it is a complex apparatus which has not been widely adopted, it is assumed that the authors were not referring to this type of tidal drainage and irrigation apparatus.

A standardized method for naming synthetic organ devices and bedside therapeutic apparatus is needed, for progress in this new field of therapy will be hindered by the general use of nonspecific terms such as "tidal drainage" or "tidal irrigation," especially when their efficacy is being questioned. The coining of such names will be difficult at best, and it is my hope that something better than the use of eponyms can be developed. Progress in this field will not be served by indulging in the personalities which eponyms necessitate whenever new apparatuses are described or old ones modified.

For the present I should like to recommend that apparatus be described by the use of diagrams or, where applicable, as in this case, by the use of time and pressure graphs which show the action of the apparatus under clinical trial. The latter suggestion is emphasized because my experience has shown the difficulty of estimating the action of such apparatus until it is actually being used in the care of the patient. Such graphic studies demonstrate the ineffectiveness of many types of tidal drainage apparatus; but they point the way to improved designs which more nearly replace the anatomic or physiologic defect which is exhibited by the patient. It appears possible that tidal drainage apparatus can be developed to the point where it will irrigate better and more dependably than is now possible with human labor, thereby pointing the way to removal of some of the tedium incident to the care of patients with neurogenic bladders.

ARTHUR E. MACNEILL, M.D., Hanover, N. H.

TUBERCULOSIS

To the Editor:—In a communication to THE JOURNAL, Nov. 9, 1946 with this heading Dr. Dock states that the "absolute pressure on the cells" in the pulmonary capillaries equals the air pressure plus the weight of the blood column in the pulmonary artery. I want to point out that the total gas pressure in the alveolar cells is about atmospheric and in the venous blood of the pulmonary capillaries substantially less than atmospheric. As far as gases are concerned, no pressure is therefore exerted in the direction from the capillaries onto the cells but rather in the opposite direction. With regard to the addend in that equation, it represents only one factor of capillary pressure; the essential factors, namely, the energy of the heart contraction, arterial and venous pressure, and the width of the arterioles and capillaries, are completely disregarded in that calculation. On the basis of his equation Dr. Dock comes to the conclusion that a lowering of the pressure by 14 per cent, produced by a change in altitude, would make (according to my theory) "the entire lung far more susceptible than the apex at sea level." My explicit statement that "the curative effect of prolonged bed rest and of high altitude appear herewith in a new light" makes it clear that Dr. Dock's conclusion is entirely a sequel of his equation and not of my theory.

It is hard to see how anybody could possibly have "discarded" in the past my theory of apical predilection in adult tuberculosis for reasons conceived now for the first time by Dr. Dock "on the basis of data only recently established." It would, however, follow from those reasons that a change in altitude of 5,000 feet would make the entire lung far more bloodless than the apex at sea level.

As regards Dr. Dock's contention that my theory was based on "data chiefly from plant physiology," I should like to state that among the twenty-six data adduced in my paper *(Wien. klin. Wchnschr.* **33**:646 [July 15] 1920) only three were from plant physiology.

FERDINAND RÖDER, M.D., New York.

ARTIFICIAL LIMBS

To the Editor:—In Queries and Minor Notes in THE JOURNAL March 1, page 656, under the heading Artificial Limbs, you state that in larger cities there are concerns that assemble artificial limbs under their own trade mark.

This would give the reader the impression that legs are being purchased in sections, in different shapes and sizes, such as the ankle, shin and thigh, bolted or riveted together and the trade mark stamped on. This, however, is not the case because most of the concerns buy the wood in different shapes. It may be either square, hexagonal or octagonal, 1 to 3 feet long and is being cut with band or hand saw and carved with drawing knife, chisel, gouge or special tools and bored and shaped invariably by hand by men who are wood carvers. These men from experience became familiar with the shape and function of the human extremities to reproduce their shape and size. They fit the stump into this shaped timber and also apply hinges to correspond to human joints. Then the limb is reinforced with suitable material and supplied with necessary upholstering and harness attachments. Moreover, the individual who does this work should be justly referred to as an artisan. He seldom has a willing teacher, the result being that through great sacrifice and hardship he acquires the knowledge and skill to manufacture an artificial limb.

The remunerationn is far less than for other work for the amount of time it takes to acquire the knowledge and the patience one has to exercise in dealing with the customer.

This, I believe, is the main reason why higher caliber men are not found in this industry. In fact, the limbs that are being manufactured today are inferior to the ones made thirty years ago.

F. A. RITTER, Detroit.

GASTRIC LAVAGE

To the Editor:—May I comment on your editorial "Value of Gastric Lavage in Treatment of Acute Poisoning" based on the recent work of Harstad, Møller and Simesen (THE JOURNAL, March 1, p. 545)? According to these investigators gastric lavage is generally inefficient because little of the poison is recovered and because it promotes passage of the poison into the intestine and other structures. My discussion will be limited entirely to the technic of lavage.

With all due respect to the Copenhagen workers, it might be suggested that "lavage with a conventional stomach tube through an attached funnel" is hardly the way to evacuate a stomach in a hurry. No procedure based on siphonage can hope to do that. The only worse way is the use of a small tube passed through the nares. Unfortunately small caliber tubes have so widely come to replace the large tube technic for gastric aspirations, at least in this country, that many recent students do not seem to have learned the large tube technic at all. Hence my interest in writing you.

The best procedure for lavage, and I think I have tried them all, is the use of a large tube, 32-42 French, to the proximal end of which can be fitted an Ewald aspirating bulb (capacity 250 cc.). The first step is the evacuation of all gastric contents. This can be done almost quantitatively (except for the solid residues) by attaching the deflater bulb and allowing suction to do the aspiration. If the gastric content is large, several such aspirations will be required. After evacuation is as complete as possible, one begins the lavage proper by injecting a bulbful of water and then aspirating as mentioned, the alternate injection and aspiration of bulbfuls being repeated until the returns are clear. The procedure is equally safe in conscious and unconscious patients. This method is very old, but those unfamiliar with it will find it described and illustrated in my "Synopsis of Digestive Diseases," St. Louis, C. V. Mosby Company, pages 26, 27 and 47.

The proof of the efficacy of this method is obtained by weighing the patient before and after the lavage. Always there must be a loss unless the stomach is empty, when the weight will be stationary. All medical students should be trained to achieve this degree of skill.

The rest of the authors' conclusions logically follow from the technic they used. It is not surprising that only 75 per cent of 10 liters of wash fluid could be removed by siphonage, and introducing a large amount of fluid (which cannot be quickly and quantitatively recovered from the stomach) is sure to promote passage into the intestine! Furthermore, no amount of vomiting, whether induced by apomorphine or otherwise, can evacuate a stomach so rapidly, so completely and so gently as the aspiration technic described.

JOHN L. KANTOR, M.D., New York.

DANGER OF TRANSMITTING MALARIA BY TRANSFUSION

To the Editor:—I believe it would be desirable to renew a warning to medical practitioners that a danger exists in transfusing recipients from donors who have had a past malarial history.

Although I have no extensive data the transfer of infection has occurred on numerous occasions all over the country. A case reported by Sharnoff, Geiger and Selzer (*Am. J. Clin. Path.* **15**:494 [Nov.] 1945) was of particular interest because blood had been stored in a bank for eight days, yet a malarial infection was transferred. When blood is stored at low temperatures, the parasites seem to exist for a long period. The actual limits of time have not been established, but eight days would seem to be quite an interval for an active blood bank.

I have been told of a soldier who had been overseas under suppressive medication and never had had experience with malaria; yet, when his blood was used in this country many months later, a malarial infection occurred in the recipient. Such an occurrence is rather unusual now, although during the war it was seen quite frequently. Most of the men are now out of the malarious areas; hence that danger is minimized. In several thousand cases seen personally no less than a hundred men first had malaria in this country after withdrawal of the suppressive drug used overseas. One man had been off the drug thirteen months before his first attack occurred.

As a routine procedure I believe physicians should be advised never to use blood from any person who has had a past history of malaria. There is an instance in Denver where a Greek's blood was used and malaria resulted although the man had been away from Greece, where he acquired his original infection, for thirty-seven years.

All returning servicemen should be questioned closely about a pastmalarial infection. One instance occurred here in which a man was asked specifically whether he had had malaria and he replied in the negative. However, his blood was infectious for the recipient and, on requestioning, he stated that he was afraid that the patient would be denied blood needed very badly and he thought it was of no importance.

It would seem that a safe time limit for a serviceman in this country after withdrawal from the endemic malaria areas and without a past history of malaria would be two years, provided he had not used suppressive drugs in the interim.

L. T. COGGESHALL, M.D., Chicago.
Chairman, Department of Medicine,
University of Chicago.

DIFFERENT WEIGHT RESPONSES TO THE SAME PROVOCATION

To the Editor:—The week after Dr. S. Charles Freed's article on obesity appeared in THE JOURNAL (February 8, p. 369) there came under my observation a man and his wife who illustrated his statement that "personality will . . . influence the intake of food." The husband was thin, wiry and tense; the wife, plump and good natured. The man was referred to me with the history that two months previously he had begun to have epigastric pain after eating, loss of appetite, frequent nausea and weakness. He had lost 13 pounds (6 Kg.) in three weeks—from 146 to 133 pounds (66 to 60 Kg.).

Complete x-ray studies of the gastrointestinal tract and gallbladder were negative except for a diverticulum of the lower end of the esophagus. The explanation for the patient's symptoms was found when his wife told me that two months before I saw him he had had an anonymous long distance telephone call from a midwestern state informing him that his daughter was dead. Twelve years previously this girl had married against the wishes of both parents, had moved "somewhere out West" and had not kept in touch with them. An attempt to trace the source of the telephone call was unsuccessful, but detectives located the girl, who was living and in good health. She came back to visit her parents, and a reconciliation took place. Naturally both parents were under great emotional strain. While the father was losing 13 pounds, however, the mother gained 26 pounds (12 Kg.), her weight increasing from 176 to 202 pounds (80 to 92 Kg.). She admitted that when she was worried she could not help eating far more than when conditions were normal.

When the husband's x-ray studies had been completed and he was assured that he had no evidence of cancer, he was able to eat the heartiest meal he had consumed since the anonymous telephone call.

WINGATE M. JOHNSON, M.D., Winston-Salem, N. C.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and the Examining Boards in Specialties were published in THE JOURNAL, April 12, page 1169.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 24-26. Sec., Dr. D. G. Gill, 519 Dexter Ave., Montgomery 4.

ARKANSAS: * *Medical. Examination.* June 5-6. Sec., Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, Texarkana. *Eclectic.* Little Rock, June 5. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written.* San Francisco, July 7-10. *Oral.* San Francisco, May 10-11. *Oral Clinical Examination for Foreign Medical Graduates.* San Francisco, June 21. Sec., Dr. Frederick N. Scatena, 1020 N. St., Sacramento 14.

DELAWARE: *Examination.* Dover, July 8-10. *Endorsement.* Dover, July 15. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * *Reciprocity.* Washington, June 9. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA: * *Examination.* Jacksonville, June 24-25. Sec., Dr. Harold D. Van Schaick, 2736 S. W. Seventh Ave., Miami 36.

GEORGIA: Atlanta, Oct. 14-16. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

HAWAII: *Examination.* Honolulu, July 8-11. Sec., Dr. S. E. Doolittle, 881 S. Hotel St., Honolulu 53.

IDAHO: Boise, July 14-16. Sec., Bureau of Occupational Licenses, Dr. S. M. Poindexter, Eastman Bldg., Boise.

INDIANA: *Examination.* Indianapolis, June. Exec. Sec., Board of Medical Registration and Examination, Miss Ruth V. Kirk, 627 K. of P. Bldg., Indianapolis.

KANSAS: *Endorsement.* Kansas City, June 26. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City 10.

KENTUCKY: *Examination.* Louisville, Sept. 22-24. Sec., State Board of Health, Dr. P. E. Blackerby, 620 S. Third St., Louisville 2.

MAINE: Augusta, July 1-2. Sec., Board of Registration in Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical Examination.* Baltimore, June 17-20. Sec., Dr. E. H. Kloman, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 10-11. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: * *Examination.* Detroit, June 9-11. Semi-Annual meeting, Lansing, June 24. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing 8.

MISSISSIPPI: Jackson, June 23-24. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MISSOURI: *Examination.* St. Louis, May 26-28 and June 9-11. Exec. Sec., Mr. John A. Hailey, Box 4, State Capitol Building, Jefferson City.

NEBRASKA: * *Examination.* Omaha, June. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, State Capitol Bldg., Lincoln.

NEVADA: *Written Examination.* Carson City, May 5. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: *Examination.* Concord, Sept. 11-12. Sec., Board of Registration in Medicine, Dr. John S. Wheeler, 107 State House, Concord.

NEW JERSEY: Trenton, June 17-18. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW YORK: *Examination.* Albany, Buffalo, New York and Syracuse, June 23-26. Sec., Dr. Jacob L. Lochner Jr., State Education Bldg., Albany.

NORTH CAROLINA: *Endorsement.* Raleigh, May 1, June 24. *Examination.* Raleigh, June 23-26. Acting Sec., Mrs. L. McNeill, 226 Hillsboro St., Raleigh.

NORTH DAKOTA: Grand Forks, July 1-4. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Examination.* Columbus, June 17-20. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: * *Endorsement.* Portland, April 25-26. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland 4.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Acting Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 23-25. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * Pierre, July 15-16. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Capitol Bldg., Pierre.

TENNESSEE: Memphis and Nashville, June 11-12. Sec., Dr. Harley W. Qualls, 1635 Exchange Bldg., 130 Madison Ave., Memphis 3.

TEXAS: Austin, June 17-19. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Building, Dallas 2.

VIRGINIA: Richmond, June 18-21. Sec., Dr. K. D. Graves, 306 Medical Arts Bldg., 30½ Franklin Rd., Roanoke.

WYOMING: *Examination.* Cheyenne, June 2. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: June 17. Sec., Mr. Francis A. Roy, Science Hall, University of Arizona, Tucson.

ARKANSAS: Little Rock, May 7. Sec., Mr. L. E. Gebauer, 701 Main Street, Little Rock.

COLORADO: Denver, June 4-5. Sec., Dr. Esther B. Starks, 1459 Ogden Street, Denver.

DISTRICT OF COLUMBIA: Washington, April 21-22. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington 1.

FLORIDA: May 31. Final date for filing application is May 16. Sec., Dr. M. W. Emmel, University of Florida, Gainesville.

MICHIGAN: Ann Arbor and Detroit, May 9-10. Sec., Miss Eloise Lebeau, 101 N. Walnut St., Lansing.

NEBRASKA: Omaha, May 6-7. Dir., Bureau of Examining Boards, State Department of Health, Mr. O. F. Humble, 1009 State Capitol Bldg., Lincoln 9.

NEW MEXICO: *Examination.* Santa Fe, May 4. Sec., Miss Marion M. Rhea, 114 E. Marcy St., Santa Fe.

OREGON: June 7. Final date for filing application is May 21. Sec., Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: *Examination.* Providence, May 14. Chief, Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Vermillion, June 6-7. Sec., Dr. G. M. Evans, 310 E. 15th St., Yankton.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Substantial Compliance With Statute of Limitations Not Sufficient.—The plaintiff filed a suit for damages allegedly caused by the malpractice of the defendant physician. From a judgment for the defendant, the plaintiff appealed to the Supreme Court of Wisconsin.

Section 330.19 of the Wisconsin statutes provides that "no action to recover damages for an injury to the person shall be maintained unless, within two years after the happening of the event causing such damages, notice in writing, signed by the party damaged, his agent or attorney, shall be served upon the person or corporation by whom it is claimed such damage was caused, stating the time and place where such damage occurred, a brief description of the injuries, the manner in which they were received and the grounds upon which claim is made and that satisfaction thereof is claimed of such person or corporation. . . ." The plaintiff's complaint was served on the defendant on Nov. 29, 1941 and it was based on alleged negligence of the defendant in his treatment of the plaintiff between June 16 and Aug. 15, 1939. This was clearly not within the required two years.

The plaintiff contended that the intent of the statute is that a defendant must be given a notice to afford an opportunity to investigate the circumstances before they become stale and to preserve evidence for his defense; he argued that a substantial compliance with such intent was sufficient and that it was not necessary to observe literally the formal statutory requirements. He then cited two steps which he claimed constituted a sufficient compliance of the statute: 1. On April 2, 1940 his attorney wrote a letter to the defendant in which he stated that he had been retained by the plaintiff "relative to the institution of a malpractice action as the result of your treatment of Mr. Beyer's fractured toe. Kindly refer this matter to your insurance carrier or contact the undersigned immediately upon receipt of this letter." 2. His attorney subsequently served on the defendant an affidavit and notice for an adverse examination. At the examination the defendant testified that the plaintiff came to his office June 16, 1939 and that the next day, after an x-ray was made of the injuries, he set the bone in plaintiff's foot and prepared the cast at the plaintiff's home.

The Supreme Court said that, in view of the express and positive provision in section 330.19 of the statutes, "No action to recover damages for an injury to the person shall be maintained unless" the injured party shall give the prescribed notice of injury or serve his complaint within two years after the event which caused such injury. The required service of such notice or a complaint is a condition precedent to the right to maintain such action. Consequently a mere substantial compliance is not sufficient. The court therefore concluded that the matters relied on by the plaintiff were not sufficient to constitute compliance with the positive requirements of the statute, that there must be stated in the required notice the time and place where the damage occurred and that satisfaction thereof is claimed of the defendant, and finally that the notice must be given in the matter required for the service of a summons in a court of records. Accordingly the trial court's judgment in favor of the defendant was affirmed.—*Beyer v. Seymer, 24 N. W. (2d) 616 (Wisconsin, 1946).*

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1937 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Fort Wayne, Ind.

14:1-46 (Jan.) 1947

*Chronic Peptic Ulcer in 94 Diabetics. M. N. Wood.—p. 1.
*Colloidal Aluminum Hydroxide Gel and Magnesium Hydroxide in Management of Peptic Ulcers. I. R. Jankelson.—p. 11.
Regional Colitis Involving Descending Colon and Sigmoid. H. J. Epstein, B. Lipshutz and M. Steinbach.—p. 13.
Vitamins and Hormones in Nutrition: III. Infection. B. F. Sieve. —p. 16.
Diagnosis of Diseases of Pancreas. R. Ehrmann.—p. 24.
Pathogenesis of Acute Infectious Hepatitis. J. I. Goodman.—p. 26.
Review of Disturbances of Fat Absorption and Fat Digestion. M. M. Kirschen and B. J. Weinberg.—p. 30.

Chronic Peptic Ulcer in Patients with Diabetes.—Wood says that among 12,000 diabetic patients observed at the George F. Baker Clinic 94 had peptic ulcer. Treatment was primarily directed toward the management of the ulcer, control of the hyperglycemia and glycosuria with insulin. The diabetes in the majority of cases was mild, thus making the problem much simpler. Even in the more severe cases of diabetes, however, a program so directed has been quite satisfactory. It is necessary to provide a well balanced diet of carbohydrates, fat and protein suitable to the diabetic state, but any type of diet required for the management of an ulcer at any stage can be calculated so that it will be a good one for both diseases and at the same time provide all the calories necessary. A table gives four such diets. Standardization should be avoided; every diet should be figured according to the specific requirements of each individual, taking into consideration his metabolism, type of work and present weight. Additional vitamins should supplement each diet. A diabetic patient temporarily out of control may at first require large doses of insulin. After a period of vigorous treatment the insulin dose necessary for adequate control will usually drop and remain fairly constant at a much lower level.

Colloidal Aluminum Hydroxide Gel and Magnesium Hydroxide in Peptic Ulcer.—Jankelson says that colloidal aluminum hydroxide gel and magnesium hydroxide combination is an effective stable buffer which acts in the stomach for several hours. With this combination ulcer pain and heartburn may be controlled with smaller and less frequent doses than are required with the colloidal aluminum hydroxide gel alone. It can be continued for long periods without the danger of an acid rebound, alkalosis or aggravation of constipation.

American Journal of Diseases of Children, Chicago

73:1-138 (Jan.) 1947

*Eczema and Essential Fatty Acids. A. E. Hansen, Elizabeth M. Knott, Hilda F. Wiese and others.—p. 1.
Substitution Transfusion: New Treatment for Severe Erythroblastosis Fetalis. H. Wallerstein.—p. 19.
Chronic Eosinophilia: Report of Case with Necrosis of Liver, Pulmonary Infiltrations, Anemia and Ascaris Infestation. Josephine G. Perlingiero and P. György.—p. 34.
Tertian, Quartan and Mixed Malarial Infections: Survey of 334 Cases of Infection with Plasmodium Vivax, 10 Cases of Infection with Plasmodium Malariae and 8 Cases of Mixed Malarial Infections in Children. N. H. Einhorn.—p. 55.

Eczema and Essential Fatty Acids.—Hansen and his co-workers made clinical and blood lipid studies on 225 patients with eczema and 101 control subjects in order to detect evidence of a possible relationship between a disturbance in essential fatty acid metabolism and the occurrence of eczema. Serum lipid studies on many of the eczematous patients disclosed that more than three fourths of the infants and children and more than half of the adults had iodine numbers for the serum fatty acids below the mean values for the control subjects. When used as the sole form of therapy of 148 eczematous patients of various ages, addition to the diet of fats rich in unsaturated fatty acids, such as lard and certain vegetable oils, produced a favorable clinical response in the majority of the patients. The specific role of the essential fatty acids appears to be that of restoring and maintaining normal nutrition of the skin. The routine inclusion of unsaturated fatty acids in the diet, while known allergens and other irritants of the skin were avoided, was found to afford the best protection against recurrent attacks of eczema, particularly infants and young children. The use of unsaturated fatty acid containing soy bean preparations as milk substitutes appears to be beneficial to a degree greater than would be anticipated on the basis of relief from sensitivity to the milk proteins alone. Sensitivity to wheat gradually may be reduced after the addition of lard to the diet.

American Journal of Ophthalmology, Cincinnati

30:1-126 (Jan.) 1947

Proliferation of Epithelium of Lens. B. Samuels.—p. 1.
Glaucoma Capsulare. H. S. Gradle and H. S. Sugar.—p. 12.
Eserine: Its History in Practice of Ophthalmology: (Physostigmine: Physostigma Venenosum Balfour: Calabar Bean). F. H. Rodin. —p. 19.
Evaluation of Newer Therapeutic Agents in Ophthalmology. E. A. Vorisek.—p. 29.
Influence of Penicillin on Course of Ocular Lesions Due to Toxic Agent. I. H. Leopold and W. O. LaMotte Jr.—p. 41.
Regarding Goniophotography. R. Rodriguez Barrios and R. Vazquez Barrierre.—p. 49.

American Journal of Surgery, New York

73:1-140 (Jan.) 1947

*War Wounds of Ventricles of Brain. W. R. Pitts.—p. 3.
Experiences in Treatment of Traumatic Cavitation in Upper Tibia. H. C. Fett, J. J. O'Connor and J. A. Johnson.—p. 11.
Practical Maneuvers in Abdominal Surgery. D. Guthrie and G. Clare Bishop.—p. 22.
Cicatrizing Enterocolitis. G. H. Pratt and L. K. Ferguson.—p. 28.
*Chlorophyll in Wound Healing and Suppurative Disease. W. F. Bowers. —p. 37.
Surgical Objectives of Anorectal Repair: Anatomic Factors in Patholysis and Drainage of Anal Infections. C. Eaton.—p. 51.
*Combined Penicillin and Sulfonamide Treatment of Peritonitis. Merle J. Brown.—p. 56.
Laryngeal Complications After Thyroid Operation: Symptoms, Prognosis and Treatment. A. F. Laszlo.—p. 62.
Fate of Ureteral Stump After Nephrectomy. F. L. Senger, A. L. Loomis Bell, H. L. Warres and W. S. Tirman.—p. 69.
Traumatic Lipohemarthrosis: Layering of Fat and Blood in Joint. H. R. Senturia and H. E. Simon.—p. 79.
Convulsions Occurring Under Anesthesia: Analysis of 6 Cases. H. T. Wikle and R. J. Ryan.—p. 83.
Classic Herniorrhaphies of Bassini, Halsted and Ferguson. J. E. Summers.—p. 87.
Traction Loop. D. L. Borden.—p. 100.
Misuse of Adrenalin and Coramine: Altered Drug Effects During Anesthesia. C. L. Burstein.—p. 102.

War Wounds of Ventricles of Brain.—Pitts says that the high fatality rate of wounds of the ventricles during the first world war was ascribed to the lack of a barrier against infection. This report deals with penetrating wounds of the cerebral ventricular system as seen and treated in an evacuation hospital. Among 108 wounds of the brain there were 16 with involvement of the ventricles. These 16 are divided into two groups, one of which includes the patients who were admitted to the hospital with signs of impending death and had short survival periods. The second group is composed of 13 operative cases with two fatalities. The operative mortality for penetrating wounds of the ventricles is two and one-half times that for penetrating wounds of the brain without ventricular involvement. Intracranial infection was not a factor in any of the deaths. Bilateral and bipolar ventricular wounds usually lead to an early fatal termination.

Chlorophyll in Wound Healing and Suppurative Disease.—Bowers records his own observations as well as those of a group of over thirty officers of the surgical service of the staff of the Winter General Hospital obtained with water soluble chlorophyll in the treatment of clean and infected wounds. The report covers more than 400 cases, representing a variety of surgical conditions. Use of chlorophyll was followd by rapid

disappearance of objectionable odors and remarkable cleanliness of the wound within two or three days. Granulation tissue seemed to be of finer texture and firmer and to form more rapidly. Epithelization also appeared to be stimulated more by chlorophyll than by penicillin. No skin irritation or adverse systemic reactions have been noted, and the chlorophyll wet dressing has been much more comfortable than dressings with saline solution, boric solution or penicillin. If chlorophyll is used as a wet dressing over a week there is a tendency to overproduction of granulation tissue, so that after the wound is clean and odorless it is advocated that chlorophyll ointment gauze be used instead of the wet dressing. Chlorophyll caused cessation of pus formation in two or three days in osteomyelitis and thoracic empyema cases. In the nose and sinus cases chlorophyll had a quicker effect in stopping purulent drainage than other agents. Physicians and patients noted the bland qualities of chlorophyll even when instilled in the eye, the nose, deep intra-abdominal abscess cavities and the pleural cavity. Chlorophyll is not antibacterial and is only weakly bacteriostatic, so that its beneficial effect is exerted through stimulation of the cells of the host.

Combined Penicillin and Sulfonamide Treatment of Peritonitis.—Brown combined sulfonamides and penicillin intraperitoneally and parenterally in patients with perforated gangrenous appendicitis with peritoneal soiling and peritonitis. The author has operated on and treated by combined chemotherapy 7 patients with acute gangrenous perforated appendicitis with diffuse peritonitis. There were no deaths, and the hospital morbidity rate averaged twelve to eighteen days. Brown concludes that the combined use of sulfonamides and penicillin is justified by the increased rate of recovery and decreased secondary complications of appendical peritonitis.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

31:1-100 (Jan.) 1947

*Penicillin Therapy in Neurosyphilis. H. Koteen, E. J. Doty, B. Webster and W. McDermott.—p. 1.
Comparison of the In Vitro Antigonococcal Actions of Penicillins G, F, K and X. E. Ellen Nell and Justina H. Hill.—p. 14.
Streptomycin in Experimental Chancroid. F. Mortara and Margaret T. Saito.—p. 20.
Rapid Treatment of Syphilis: Comparison of Results Using Five Treatment Methods. H. M. Leavitt.—p. 27.
Penicillin Therapy of Early Syphilis. H. L. Holley.—p. 41.
Treatment of Early Syphilis with 600,000 Units of Penicillin in Seven and One-Half Days. T. J. Bauer, H. N. Bundesen, R. M. Craig, G. X. Schwemlein and R. L. Barton.—p. 45.
Rapid Treatment of Prenatal Syphilis. S. Olansky and R. Beck.—p. 51.
Use of Pyribenzamine Hydrochloride in Controlling Urticaria Due to Penicillin. R. H. Kampmeier.—p. 57.
Cutaneous Infection with Neisseria Gonorrheae, with Development of Lymphangitis Resulting from Laboratory Accident. H. J. Sears.—p. 60.
Evaluation of Ducrey Skin Test for Chancroid. R. B. Dienst and S. W. Gilkerson.—p. 65.
Diagnostic Tests in Differential Diagnosis of Anogenital Lesions. H. Packer and Anna Dean Dulaney.—p. 69.
Effect of Sulfonamide Therapy on Persistence of Virus of Lymphogranuloma Venereum in Buboes. A. Heyman, Margaret J. Wall and P. B. Beeson.—p. 81.

Penicillin in Neurosyphilis.—This report by Koteen and his associates is based on observations of the effects of penicillin therapy in 111 patients with neurosyphilis treated in the medical service of the New York Hospital. All the patients have been followed for at least twelve months after the cessation of treatment. Six of 11 patients with dementia paralytica attained remissions of their disease. Four of the 5 patients who failed to show significant improvement were badly deteriorated prior to therapy. There was a great change in the cerebrospinal fluid abnormalities not only in those paretic patients who showed clinical improvement but also in some who failed to improve clinically. Forty-one patients with tabes dorsalis complained of a total of fifty-seven symptoms. There was subjective improvement in thirty-three of the fifty-seven symptoms after penicillin therapy. No striking improvement was observed in the objective manifestations of tabes dorsalis. In isolated examples of various clinical forms of meningovascular syphilis the therapeutic results after penicillin were comparable to those usually observed after arsenotherapy. The authors conclude that the administration of penicillin for a two week period produces a striking effect on the cerebrospinal fluid abnormalities and certain of the clinical manifestations of late neurosyphilis. It is believed that the penicillin therapy of neurosyphilis (exclusive of primary optic atrophy) approaches and may equal fever therapy in effectiveness.

Annals of Surgery, Philadelphia

125:1-128 (Jan.) 1947

Expeditious Care of Full Thickness Burn Wounds by Surgical Excision and Grafting. O. Cope, J. L. Langohr, F. D. Moore and R. C. Webster Jr.—p. 1.
Esophageal Atresia and Tracheoesophageal Fistula. W. E. Ladd and O. Swenson.—p. 23.
Pulsion Diverticulum of Pharyngoesophageal Junction: Technic of One Stage Operation; Preliminary Report. R. H. Sweet.—p. 41.
*Anatomic Data Regarding Surgical Treatment of Angina Pectoris. G. Saccomanno, R. A. Utterback and R. M. Klemme.—p. 49.
Ten Year Survey of Intestinal Obstruction. E. L. Eliason and R. F. Welty.—p. 57.
*Traumatic Pancreatitis. T. A. Shallow and F. B. Wagner Jr.—p. 66.
Surgical Treatment of 1,545 Herniae. F. Glenn.—p. 72.
*Scalenotomy: Analysis of 11 Cases Done for Scalenus Anticus Syndrome. J. F. Tanna.—p. 80.
Experiences with Posttraumatic Osteomyelitis in World War II. W. M. Weeden, G. McNeer, H. D. Stein and J. C. Long.—p. 89.
Bone Grafting Methods: Two Illustrative Case Reports. P. C. Colonna.—p. 96.
Experimental Observations on Absorbable Alginate Products in Surgery: Gel, Film, Gauze and Foam. G. Blaine.—p. 102.
Nutritional Rehabilitation of Surgical Patients. J. H. Remington, J. A. Bargen and J. DeJ. Pemberton.—p. 115.
Technic for Testing Hypertensive Patients Preoperatively. J. L. Southworth and H. I. Russek.—p. 119.

Surgical Treatment of Angina Pectoris.—Saccomanno and his associates determined on dogs that stimulation of isolated spinal nerves produced cardiac acceleration and a rise in systemic blood pressure when the second through the sixth thoracic spinal nerves were stimulated. No change in heart rate or blood pressure was observed when the eighth cervical or first thoracic spinal nerves were stimulated, indicating that these segments do not convey cardiac efferent fibers. The effect on pulse rate was greatest in the second and third thoracic nerves, with diminishing effect in the fourth and fifth and very slight effect below the fifth thoracic nerve. The effect on systemic blood pressure was more or less constant from the second thoracic down to the seventh thoracic nerve. By means of surgical removal or alcohol injection of the second, third and fourth thoracic sympathetic ganglions on the affected side a complete alleviation of anginal pain and a reduction of coronary vasospasm should result.

Traumatic Pancreatitis.—Shallow and Wagner say that within the past four years 28 cases of acute pancreatitis have been encountered in the Jefferson Medical College Hospital, 20 of the edematous type and 8 of the hemorrhagic type. A conservative nonoperative treatment was generally employed, operation being reserved for the complications. One case is unique in that it followed a nonpenetrating upper abdominal injury. Sustained extremely high serum amylase values were observed and recovery took place without complications following conservative therapy. Trauma accounts for approximately 2 to 4 per cent of cases of acute pancreatitis. Following an upper abdominal injury, acute pancreatitis should always be suspected. Suspicion of traumatic pancreatitis should be confirmed by the serum amylase test. Nonoperative management, which has greatly reduced the mortality in the usual types of pancreatitis, is advocated for cases following nonpenetrating abdominal injury, if serious injury to other organs and massive hemorrhage can be ruled out.

Scalenotomy for Scalenus Anticus Syndrome.—Tanna states that the symptoms of scalenus anticus syndrome are the result of spasm of the scalenus anticus muscle resulting in compression of the brachial plexus and subclavian artery, with the creation of a vicious circle. Pain may be experienced in the shoulder, arm, forearm or even extending into the hand. The pain sometimes extends to the cervical spine, to the scapula and to the thoracic wall. The pain may be of the acute, lancinating type or dull or aching. Sympathetic nervous involvement is manifested by vasomotor spasm, lack of capillary action in the fingers and reduction of temperature, which frequently simulates Raynaud's disease. Conditions from which it

must be differentiated are cervical rib, cervicodorsal sympathalgia, Raynaud's disease, subacromial bursitis, supraspinatus tendon rupture and brachial neuritis. The author reviews 11 consecutive cases of scalenus anticus syndrome for which scalenotomy was done. The results have been excellent. Seven of these cases were not associated with a cervical or abnormal rib, indicating that the scalenus anticus syndrome occurs with much greater frequency than the cervical rib syndrome. Scalenotomy may not be necessary in mild cases.

Archives of Pathology, Chicago

42:557-666 (Dec.) 1946

Pathologic Changes in Gouty Arthritis. Mary S. Sherman.—p. 557
Brain Repair: I. Phospholipid-Splitting Enzymes of Brain Phagocytes. S. P. Hicks.—p. 564.
Renal Intratubular Syncytial Masses: Note on Their Origin. Elizabeth Lowenhaupt.—p. 572.
Myocardial Granulomas in Subacute Bacterial Endocarditis. O. Saphir. —p. 574.
Organized Emboli of Tertiary Pulmonary Arteries: Unusual Causes of Cor Pulmonale. B. Castleman and E. F. Bland.—p. 581.
Absence of Left Cardiac Ventricle with Aplasia of Aortic Orifice and Hypoplasia of Aorta. M. A. Hyman.—p. 590.
*In Vitro Effect of Penicillin on Endameba Histolytica. Elta W. Knoll and Katharine M. Howell.—p. 594.
Some Effects of Prolonged Massive Estrogen Treatment on the Rat, with Special Reference to Thymus. J. C. Plagge.—p. 598.
Medial Calcification of Arteries of Infants. Miriam H. Field.—p. 607.
*Pathologic Changes Resulting from Administration of Streptomycin. C. W. Mushett and H. S. Martland.—p. 619.

Penicillin and Endameba Histolytica.—Knoll and Howell observed in in vitro studies that penicillin had little or no effect on cultures of Endameba histolytica, either the trophozoites or the cysts. By inference it seems probable that the improvement observed in the clinical symptoms of patients with amebiasis under penicillin therapy must be due to the action of the drug on the secondary bacterial invaders of the tissues.

Pathologic Changes Resulting from Streptomycin.—Mushett and Martland found that the parenteral administration of highly purified as well as average streptomycin samples resulted in fatty metamorphosis of the liver in monkeys and dogs. Large doses of streptomycin concentrates produced small foci of necrosis in the livers of dogs. Fatty metamorphosis was observed less often in the kidneys, but albuminous detritus appeared in the subcapsular spaces and the tubules of the kidney in some of the monkeys. Hyaline and granular casts, epithelial cells and occasionally blood cells were seen in the sediment of the centrifuged urine of dogs receiving large doses of streptomycin concentrates. Focal tubular necrosis occurred in the kidneys of 1 dog. The fatty change observed in the liver and the kidney was found to be reversible. Slight normocytic anemia also disappeared on cessation of dosage. Prolonged administration of streptomycin concentrates of average purity resulted in neurotoxic effects in dogs, but streptomycin samples of higher potency did not produce neurotoxic symptoms in dogs.

Archives of Physical Medicine, Chicago

27:729-782 (Dec.) 1946

Manipulation. M. Smart.—p. 730.
Physical Medicine in Treatment of Rheumatic Disorders: Impression from War Years. F. Bach.—p. 734.
Medical Aspects of Rehabilitation. T. M. Ling.—p. 738.
Implications of Hydrotherapy. M. B. Ray.—p. 742.
*Problems of Physical Therapy for Persons with Traumatic Paraplegia. L. Guttmann.—p. 750.

Physical Therapy in Traumatic Paraplegia.—Guttmann gives an account of methods of physical readjustment practiced in a center caring for over 160 patients with spinal injuries. Physical therapy in paraplegic patients has two aims: (1) prevention of contractures and atrophy in the paralyzed part of the body and (2) adaptation therapy of normal parts of the body. The significance of the overdevelopment of muscles which can compensate for the loss of the paralyzed muscles is discussed. Swinging, dressing and balancing exercises have proved invaluable in the mobilization of compensatory mechanisms for the postural adaptation of paraplegic patients. Games, especially wheelchair polo, play an essential part in the physical restoration of persons with traumatic paraplegia.

Bulletin of Johns Hopkins Hospital, Baltimore

79:365-484 (Dec.) 1946

Report on Epidemic of Mild Lymphocytic Meningitis in Burma. F. W. Kibbe and W. G. Beadenkopf.—p. 365.
*Studies on Schistosomiasis Japonica: 2. Analysis of 364 Cases of Acute Schistosomiasis, with Report of Results of Treatment with Fuadin in 184 Cases. W. L. Winkenwerder, A. V. Hunninen, T. Harrison and others.—p. 406.
Problem of Identification of Oral Spirochetes and Description of Precipitin Test for Their Serologic Differentiation. L. B. Robinson and Ruth H. Wichelhausen.—p. 436.
Control of Experimental Pneumonia with Penicillin: II. Comparison of Intramuscular, Respiratory and Oral Routes of Administration with Respect to Therapeutic Activity and Rate of Absorption. Catherine E. Wilson, Carolyn W. Hammond, Ann F. Byrne and Eleanor A. Bliss.—p. 451.

Schistosomiasis Japonica.—Winkenwerder and his associates review the observations made on 364 cases in the epidemic of schistosomiasis japonica which began soon after the reoccupation of Leyte in October 1944. The first patients developed symptoms one month after the landing on the island. The outbreak reached its peak in January, then gradually subsided, and came to an end in May. In the pretreatment stool examination, mature ova were found in 344 cases. Only immature ova were found in 16 cases, in which after treatment had been instituted mature ova were found. All patients were treated with an antimony compound: fuadin, antimony and potassium tartrate (tarter emetic) or anthiomaline. Only the results obtained in the treatment of 210 patients given a total dose of 40 cc. of fuadin are reported in detail. Ova disappear from the stools usually between the tenth and sixteenth days of treatment with fuadin. The viability of the eggs appears to be unaffected by fuadin, and their disappearance from the stools is probably attributable to the effect of the drug on ovulation in the female worm. The symptoms of acute schistosomiasis subside at approximately the same time at which the eggs disappear from the stools. Following one course of 40 cc. of fuadin relapses have been encountered in approximately 40 per cent of the cases. In only 4 of 55 relapses were symptoms of schistosomiasis noted. In all other cases the relapse was characterized solely by the reappearance of ova in the stools. The tendency to relapse appears to be related to the severity of the initial illness. Relapses are more likely to occur in those who have a persistent eosinophilia following the first course of treatment. The finding of intestinal nodules on sigmoidoscopy may be helpful in detecting a relapse; they occur in the absence of ova in the stools. Only 2 of the patients exhibited mild toxic effects during treatment with fuadin. Doses up to a total of 80 cc. in a single course have been administered without serious toxic effects. The therapeutic effect of these larger doses cannot be analyzed until a later date.

Canadian Medical Association Journal, Montreal

56:1-128 (Jan.) 1947

Present Status of Antibiotics in Therapy. J. A. Dauphinee.—p. 1.
*Laryngotracheobronchitis: Statistical Review of 549 Cases. E. A. Morgan and D. E. S. Wishart.—p. 8.
"Shock Therapies" at Ontario Hospital, London. J. J. Geoghegan.—p. 15.
Seborrheic Dermatitis. I. Price.—p. 25.
Safety Measures in Practice of Anesthetics. B. C. Leech.—p. 28.
Industrial Health Problems Encountered in the War. J. G. Cunningham.—p. 34.
Chronic Problems in Industrial Surgery. W. N. Kemp.—p. 41.
Rh Factor and Erythroblastosis. C. E. Snelling.—p. 47.
Estimation of Liver Function. H. K. Detweiler.—p. 51.
*Circumcision and Venereal Disease. R. A. Wilson.—p. 54.
Small Tumors of Skin. H. A. MacKechnie.—p. 56.
Nutrition in Surgery. H. R. Robertson and D. W. Smaill.—p. 59.
Kuntscher Method of Intramedullary Pin Fixation. R. K. Magee.—p. 65.

Laryngotracheobronchitis.—Morgan and Wishart discuss the disease which in the last decade has been termed, almost universally, laryngotracheobronchitis. The term is at best a diagnosis of convenience to describe cases presenting the same initial clinical picture. An analysis was undertaken of 549 cases. The series does not include cases of laryngeal diphtheria, but it does include cases of spasmodic croup. Sixty-nine per cent of the cases occurred under the age of 2 years and only 5 per cent over 6 years. The bacteria isolated were Streptococcus hemolyticus, Staphylococcus aureus and the pneumococcus. Hemophilus influenzae was infrequently found. Many infections were due to a virus. These were recognized by the lack

of response to antibiotic drugs, failure to demonstrate pathogenic bacteria in the cultures, a normal leukocyte count or a leukopenia and a fairly typical clinical course. Antibiotic drugs are of value in prophylaxis and should be exhibited in every case of simple spasmodic croup. Tracheotomy should be performed early, but subsequent bronchoscopic suction must be frequently resorted to. Intubation cannot be recommended. The postoperative management requires experienced nurses and the constant attendance of a trained bronchoscopist. The principal causes of death are failure to relieve obstruction, overwhelming toxemia, postoperative infection, pneumothorax and mediastinal emphysema. Most deaths were in children under 4 years of age. Hyperpyrexia is a serious prognostic sign. The mortality rate has been gradually reduced in the last twenty years.

Circumcision and Venereal Disease.—Wilson collected information regarding previous circumcision on 1,304 consecutive patients at a Canadian army venereal disease treatment center. One thousand recruits at an army reception center were examined to determine the incidence of circumcision among Canadian army personnel. The figures obtained show that 76.7 per cent of the venereal disease group were uncircumcised, whereas in the control group 52 per cent were uncircumcised. The most striking difference is in syphilis, in which 90 per cent of the patients were uncircumcised. It is considered unlikely that the uncircumcised are significantly more promiscuous. Discussing the possible causes of the higher incidence of venereal disease in the uncircumcised, the author says that in gonorrhea it could be due to the fact that the foreskin, after coitus, retains infectious mucus. Here is an ideal environment of moisture and warmth, the organisms multiply and provide heavy contamination of the adjacent urethral mucosa. That syphilis is more common in uncircumcised soldiers seems even more reasonable, since tears and abrasions of the foreskin provide a port of entry for the spirochete.

Georgia Medical Association Journal, Atlanta

36:1-52 (Jan.) 1947

Hyperparathyroidism. C. J. McLoughlin.—p. 1.
Blood Sedimentation Test as Aid in Diagnosis. C. P. Roberts.—p. 4.
Rh Factor in Blood Typing. A. J. Ayers.—p. 6.
Rh Factor in Infancy and Childhood. R. C. McGahee.—p. 8.
Digression on Sexual Hair. R. B. Greenblatt.—p. 13.
Recognition and Management of Early Psychosomatic Disorders. R. S. Leadingham.—p. 19.
Medical Education and Medical Care in Georgia—Past, Present, Proposed.—G. L. Kelly.—p. 23.
Complications of Antirabic Treatment. T. F. Sellers.—p. 30.
Peroral Endoscopy: Six Year Report. W. L. Barton.—p. 35.
Experiences with Malaria on a Pacific Island. C. D. Fowler.—p. 38.

Journal of Immunology, Baltimore

54:325-404 (Dec.) 1946

*Circulating Antitoxin at Onset of Diphtheria in 425 Patients. J. Ipsen.—p. 325.
Nutrition and Resistance to Infection: Bactericidal Properties and Phagocytic Activity of Peritoneal Fluid of Rats in Various States of Nutritional Deficiency. K. Guggenheim and Edith Buechler.—p. 349.
Studies on Chick Embryo Vaccines Against Japanese B Encephalitis. H. Koprowski and H. R. Cox.—p. 357.
Virus of Ilhéus Encephalitis: Physical Properties, Pathogenicity and Cultivation. H. Koprowski and T. P. Hughes.—p. 371.
Occurrence of Nonspecific Virus-Neutralizing Properties in Serums of Some Neotropic Mammals. H. Koprowski.—p. 387.

Circulating Antitoxin in Diphtheria.—Ipsen determined the antitoxin titer of 425 patients with laryngeal diphtheria. Of these 287 were unvaccinated, 32 vaccinated once and 106 vaccinated with more than one injection. In the vaccinated the course of the disease was distinctly milder than that of the unvaccinated, while the antitoxin titer was much higher for the former than for the latter. When the unvaccinated are divided into groups according to the severity of the disease there is only a slight difference in the antitoxin titers of the groups. When all the cases are grouped according to the antitoxin titer there is a scarcely demonstrable difference in the course of the disease for groups with a high titer and those with a low titer. Comparison of antitoxin titers in patients having diphtheria with those in the rest of the population revealed fewer with a titer higher than 0.1 antitoxin unit among patients with diphtheria. In further statistical studies the author found a single quantity as an indicator for the course of the disease for each patient. The average course of each group can then be computed as the mean of the course of the individual cases. This provides greater statistical certainty than an analysis of the percentage of complications.

Journal of Infectious Diseases, Chicago

79:199-290 (Nov.-Dec.) 1946

Action of Streptothricin and Other Antibiotic Agents on Blastomyces Dermatitidis Infections of Chick Embryo. Esther Meyer and Z. J. Ordal.—p. 199.
Studies on Metabolism of Streptococcus Pyogenes: I. Oxygen Consumption in Presence of Glucose and Certain Additional Substances. G. W. Waring Jr. and L. Weinstein.—p. 205.
Effect of Splenectomy on Avian Malarial Infections. L. A. Terzian.—p. 215.
Immunologic Relationships Among Polysaccharides from Various Infectious Organisms. J. Oliver-González.—p. 221.
Illness in Man Following Inhalation of Serratia Marcescens. T. F. Paine.—p. 226.
Respiratory Pathogenicity of Bacillus Anthracis Spores: I. Methods of Study and Observations on Pathogenesis. G. A. Young Jr., M. R. Zelle and R. E. Lincoln.—p. 233.
Id.: II. Genetic Variation in Respiratory Pathogenicity and Invasiveness of Colonial Variants of B. Anthracis. M. R. Zelle, R. E. Lincoln and G. A. Young Jr.—p. 247.
Id.: III. Changes in Pathogenicity Due to Nutritional Modifications. R. E. Lincoln, M. R. Zelle, C. I. Randles, J. L. Roberts and G. A. Young Jr.—p. 254.
Id.: IV. Chemical-Biological Synergisms. G. A. Young Jr. and M. R. Zelle.—p. 266.
Effect of Vitamin A. Deficiency on Plasmodium Lophurae Infection in Ducks. R. H. Rigedon.—p. 272.
Studies on Cultivation of Japanese B Encephalitis Virus in Eggs. H. R. Morgan, R. L. Early and Mary E. McClain.—p. 278.
Effects of Atabrine on Saurian Malarial Parasite, Plasmodium Floridense. P. E. Thompson.—p. 282.

Journal of Urology, Baltimore

56:515-612 (Nov.) 1946

Giant Hydronephrosis as Cause of Pyonephrosis in Opposite Kidney: Report of Case. R. R. Zimet and L. Kappel.—p. 515.
Wilms Tumor in Horseshoe Kidney. E. J. McGinn and J. M. Wickham.—p. 520.
Postcaval Ureter: Report of Surgical Case. M. H. Nourse and H. C. Moody.—p. 525.
Hypoplasia of Ureter with Renal Agenesis. J. L. Hamilton.—p. 530.
Acute Interstitial Cystitis: Clinical Entity. C. Tahara, C. Lechner and E. Hess.—p. 535.
Priapism Complicating Sickle Cell Anemia: Case Report. J. Rosokoff and E. L. Brodie.—p. 544.
Actinomycosis of Testicle. W. J. Baker and A. B. Ragins.—p. 547.
*Mumps Orchitis: Surgical Treatment. N. Nixon and D. B. Lewis.—p. 554.
Late Effects of Battle Wounds in Genitourinary Tract. L. E. Hawes.—p. 561.
Study of 50 Cases of Enuresis. A. D. Vogelsang.—p. 584.
*Grain Mite Infestation of Urinary Tract: Report of 3 Cases. A. M. Crance.—p. 588.
Oral Penicillin in Treatment of Neisserian Infections. L. D. Seager, W. G. Shoemaker, S. Mulholland, Ruth E. Miller, G. R. Wells and Kathryn B. Barnes.—p. 594.
Sulfathiazole Anuria with Recovery Following Renal Decapsulation. A. H. Kleiman.—p. 598.
Advantages of Cotton as Suture Material in Urologic Surgery. W. F. Melick.—p. 602.
Proved Ineffectiveness of Compression Bag in Intravenous Pyelography. H. E. Carlson.—p. 609.

Mumps Orchitis.—Nixon and Lewis say that 101 of 339 soldiers with mumps developed orchitis. In 68 the orchitis was of sufficient severity to warrant operation. Early surgical treatment of mumps orchitis is of value in promptly relieving pain, nausea, vomiting, backache and fever, shortening the period of disability and preventing subsequent atrophy of the involved testis. Without operation the acute symptoms of mumps orchitis will disappear more gradually, requiring three to four additional days of hospitalization, and testicular atrophy will result in 40 to 60 per cent. Observations in this series suggest that the atrophy is not caused alone by the inflammation of the parenchyma and the resistance offered by the firm tunica albuginea but that the tunica vaginalis also is involved in the development of increased pressure with resulting necrosis. It is believed that early drainage of the hydrocele fluid is necessary to avoid subsequent atrophy of the testis and that early incision of the tunica vaginalis is sufficient to insure optimum results.

Grain Mite Infestation of Urinary Tract.—Crance presents 3 cases of grain mite infestation of the bladder. Entry probably occurs as the result of direct contact of infected fecal material with the urethra. However, in the male this is hardly

possible, and it has been suggested that the eggs may reach the bladder through the kidney and ureters and hatch the mite after implanting themselves on the bladder wall. The fact that, according to the meager literature, infestation with the mite is about as frequent in males as in females is more or less against the direct contamination theory but rather in favor of the theory that the eggs proceed through the intestinal tract, thence to the kidney and downward into the bladder. In the reported cases favorable therapeutic results were obtained with bladder irrigations followed by instillations of mild protein silver.

Medical Annals of District of Columbia, Washington

16:1-56 (Jan.) 1947

Can We Win the Peace Through Science? A. H. Waitt.—p. 1.
Experience with Series of 450 Cases of Pilonidal Disease at Naval Hospital. V. T. Young.—p. 6.
Migraine Headache: Treatment of 51 Patients with Dihydroergotamine. L. S. Blumenthal and Barbara Fakler.—p. 10.
Treatment of Gonorrhea with Streptomycin: Preliminary Report with Cure of Four Cases. L. E. Putnam, R. P. Herwick, S. R. Taggart and B. D. Chinn.—p. 14.
Role of Pediatrician in Poliomyelitis. J. S. Wall.—p. 15.

Military Surgeon, Washington, D. C.

100:1-104 (Jan.) 1946. **Partial Index**

Active Immunization Against Malaria: (Wellcome Prize Essay, 1946). C. J. Wildman.—p. 1.
Early Nerve Suture. A. Ecker.—p. 14.
Are Doctors Educated? A Plea for More Correct Pronunciation of Medical Terms. A. R. Koontz.—p. 35.
Medical Service at Bastogne. C. S. Phalen.—p. 37.
Orientation to Psychosomatics. H. A. Davidson.—p. 47.
Statistical Follow-Up of Effectiveness of Treatment of Combat-Induced Psychiatric Casualties: I. Returns to Full Combat Duty. A. O. Ludwig and S. W. Ransom.—p. 51.
The Borderline and Mentally Defective Prison Inmate. H. R. Lipton.—p. 62.
Clinical Note on Electrocardiography Under Hypnosis. J. M. Schneck.—p. 65.
Problems Related to Venous System of Lower Extremities Among Army Personnel. L. K. Stalker.—p. 66.

Minnesota Medicine, St. Paul

29:1185-1294 (Dec.) 1946

Reactions Following Blood Plasma Transfusions: Their Control and Prevention. W. D. Stovall.—p. 1209.
Cytology of Erythrogenic Reticulum of Bone Marrow in Pernicious Anemia Before and After Administering Folic Acid. G. Fahr and A. E. Walch.—p. 1212.
Penicillin. J. F. Briggs.—p. 1215.
Atypical Chronic Glomerulonephritis: Report of Cases. G. W. Daugherty, A. H. Baggenstoss and N. M. Keith.—p. 1218.
Relationship Between Pregnancies and Age of Occurrence of Breast Cancer in Humans: Preliminary Report. C. P. Oliver, E. T. Bell, J. J. Bittner and others.—p. 1230.
Relationship Between General Practitioner and Specialist. O. J. Campbell.—p. 1233.

New England Journal of Medicine, Boston

235:919-956 (Dec. 26) 1946

*Problems Arising in Treatment of Syphilis with Penicillin. W. R. Hill.—p. 919.
Medical Care Problem in United States. L. H. Bauer.—p. 924.
Recent Advances in Care of Surgical Complications of Diabetes Mellitus. L. S. McKittrick.—p. 929.
Medical Experiences with American Troops in Pacific, with Remarks on Diagnostic Value of Sternal Puncture in Malaria and Innocuousness of Hookworm Infection. H. D. Levine.—p. 933.
Digitalis. A. S. Freedberg and P. M. Zoll.—p. 938.
Lymphoblastic Lymphoma of Small Bowel.—p. 946.
Diverticulitis of Sigmoid.—p. 949.

Penicillin in Syphilis.—Among 75 patients with early syphilis given penicillin 2 had serologic and 3 had clinical (mucocutaneous) relapses. One of the latter group, a pregnant woman with secondary syphilis, had been treated with 1,200,000 Oxford units of penicillin. At the time of delivery of a normal appearing infant the mother's serologic reaction was positive. The serologic reaction in the infant was negative until the third month, when it became positive. At that time both the mother and the infant presented cutaneous lesions suggestive of secondary syphilis. The incidence of severe reactions in penicillin treatment is insignificant, but the Herxheimer reaction was noted in 75 per cent of patients with early syphilis; this, however, does not call for discontinuation of therapy. In order to prevent masking of syphilis, it seems necessary to subject patients receiving penicillin for gonorrhea to a six months follow-up study for syphilis. Hill says that any patient who has gonorrhea and shows an early Herxheimer reaction, evidenced by a rise in temperature after the first injection of penicillin, should be examined for syphilis.

New Orleans Medical and Surgical Journal

99:259-312 (Dec.) 1946

Infectious Hepatitis in Children. C. H. Webb, S. G. Wolfe, R. T. Lucas and C. E. Anderson Jr.—p. 259.
Acute Diarrhea in Children. J. Watt and Margaret F. Gutelius.—p. 266.
Chronic Cough in Children. R. V. Platou.—p. 270.
Meningococcal Adenitis: Case Report with Discussion. R. D. Nyman and J. W. Brueck.—p. 274.
The Well Child. D. W. Van Gelder.—p. 277.
Some Correctible Anomalies of Heart and Great Vessels. S. P. Wise.—p. 280.
Splenomegaly with Cirrhosis of Liver Complicating Juvenile Diabetes: Case Report with Splenectomy. R. Kapsinow.—p. 285.
Waterhouse-Friderichsen Syndrome: With Review of Literature and Addition of 3 New Cases from Charity Hospital of Louisiana. C. P. Wasserman.—p. 286.

Northwest Medicine, Seattle

46:1-82 (Jan.) 1947

Office Management of Chronic Arthritis. K. K. Sherwood and B. Zimmerman.—p. 30.
Gold Therapy in Rheumatoid Arthritis. W. Darley.—p. 34.
Diagnosis of Rheumatic Fever. P. F. Guy.—p. 38.
Pathology of Rheumatic Fever. W. B. Drew.—p. 39.
Trends in Electrocardiography: Bipolar Standard Limb Leads versus Unipolar Precordial Leads. M. Schwartz.—p. 43.
Psychosis Due to Bromide Intoxication. G. A. Rickles, W. H. Todd, A. A. Magliolo and T. W. Green.—p. 47.
Brenner Tumor: Case Report. J. C. Brougher.—p. 49.

Occupational Medicine, Chicago

2:421-530 (Nov.) 1946

Legal and Administrative Handicaps to Rehabilitation Program. B. E. Kuechle.—p. 421.
Symposium on Atomic Energy in Industry and Medicine: Essential Safeguards in Production and Use of Atomic Energy. J. E. Wirth.—p. 428.
Atomic Energy in Industry and Physical Sciences. S. K. Allison.—p. 439.
Physiologic Effects of Nuclear Energy. S. Warren.—p. 447.
*Occupational Dermatoses in Aircraft Workers: Chromate Dermatitis. F. A. Ellis.—p. 452.
Thymol-Barbital Turbidity Test in Experimental Carbon Tetrachloride Poisoning. H. Brieger and M. H. F. Friedman.—p. 463.
*Some Hematologic Observations in Silicosis. H. Heimann.—p. 470.

Occupational Dermatoses in Aircraft Workers.—Ellis says that in an aircraft plant employing about 40,000 workers 235 persons were referred during 1944 and 1945 for examination of various dermatoses, which were suspected of being occupational in origin. Of these 133 proved to have nonoccupational dermatitis; 81 were considered to have occupational dermatitis; 21 had contact dermatitis of undetermined origin. Primary irritants were the cause of the eruption in 36 of the 81 patients with occupational dermatitis. Contact dermatitis was the cause in 24; in 20 of these the dermatitis was due to chromates. In about one fourth of the cases of occupational dermatitis the disease was due to chromates. Contact dermatitis due to chromates is usually an acute, weeping, crusted dermatitis involving the exposed parts and with occasional generalized dermatitis. Nummular lesions similar in form to nummular eczema developed in some of the patients. The eyelids were involved in 8 of the patients who had a contact dermatitis due to chromates. Hardening to chromates does not develop in workers sensitive to chromates. Patch tests with 5 per cent solution of sodium chromate and with the dry painted metal elicited reactions of similar degrees of positivity.

Hematologic Observations in Silicosis.—Heimann reports hematologic observations on 65 persons with silicosis with and without superimposed infection. He found that the disease was associated with a rise in the number of young polymorphonuclear leukocytes, a rise in mean corpuscular hemoglobin and an increased rate of erythrocyte sedimentation. In simple silicosis as well as in silicosis with infection there is a shift to the left of the polymorphonuclear leukocytes and an increase in the rate of the erythrocyte sedimentation. These data suggest that

neither an abnormally increased sedimentation rate nor a shift to the left of the polymorphonuclear leukocytes in silicosis necessarily indicates that pulmonary infection is present as a complication of the fibrotic condition of the lungs.

Psychiatry, Washington, D. C.

9:293-418 (Nov.) 1946

Remarks on Philosophy of Mental Disorder. Frieda Fromm-Reichmann.—p. 293.
Social Causation in English Novel of Armistice Interval. E. Boll.—p. 309.
Psychotherapy of Adolescent Catatonic Schizophrenia with Mutism: Study in Empathy and Establishing Contact. R. P. Knight.—p. 323.
Psychiatric Activities During Normandy Offensive, June 20 to Aug. 20, 1944: An Experience with 5,203 Neuropsychiatric Casualties. P. S. Wagner.—p. 341.
Observations on Defenses Against Transference Neurosis. Joan Fleming.—p. 365.
Some Observations on Character Structure in the Orient: II. Chinese Part Two. W. La Barre.—p. 375.

Public Health Reports, Washington, D. C.

62:1-40 (Jan. 3) 1947

*Crystalline Antibacterial Substance from Lichen Ramalina Reticulata. A. Marshak.—p. 3.
*Disseminated Pulmonary Calcification: Report of 113 Cases. R. H. High, H. B. Zwerling and M. L. Furcolow.—p. 20.

62:41-76 (Jan. 10) 1947

Relation of National Mental Health Act to State Health Authorities. R. H. Felix.—p. 41.
Hospital Survey and Construction Act. V. M. Hoge.—p. 49.

Antibacterial Substance from Lichen Ramalina Reticulata.—According to Marshak, Ramalina reticulata, sometimes called California Spanish moss, is a lichen of the family Usneaceae which grows as an epiphyte along the west coast of North America. The plant has no integument but does contain in the interstices between hyphae and algal cells a carbohydrate substance which is very hygroscopic. The carbohydrate, when separated from the plant, is an excellent medium for the growth of many types of bacteria. A crystalline substance has been isolated from the lichen Ramalina reticulata, with a melting point of 191 to 192 C. and an empirical formula of $C_{16}H_{14}O_6$. It can be administered subcutaneously in oil daily for three weeks at a rate of 10 to 20 mg. for each 350 to 400 Gm. of guinea pig without obvious toxic effects. When so administered to guinea pigs infected intraperitoneally with human tubercle bacilli of the strain $H_{37}RV$ it appears to retard the progress of the disease.

Disseminated Pulmonary Calcification.—High and his associates collected 113 instances of disseminated pulmonary calcification and studied the skin reactions to tuberculin and histoplasmin. Of 108 patients who received both tests, 104, or 96.3 per cent, reacted to histoplasmin, while only 4 had negative reactions to this antigen. None reacted only to tuberculin, but a few reacted to both antigens. The authors think that there is strong evidence that disseminated calcifications are not frequently caused by tubercle bacilli but probably by the agent producing sensitivity to histoplasmin.

Radiology, Syracuse, N. Y.

47:551-654 (Dec.) 1946

Rheumatoid Spondylitis: Correlation of Clinical and Roentgenographic Features. E. W. Boland and E. M. Shebesta.—p. 551.
Giant Cell Tumors of Soft Tissue Origin. M. I. Smedal.—p. 562.
Osteohydatidosis: Its Radiologic Features. M. A. Bellini.—p. 569.
*Roentgen Diagnosis of Duodenal Ulcer in Right Lateral Decubitus Position. S. Brown and F. G. Harper.—p. 575.
*Cancer of Breast: Study of Patients Treated Over Period of Twenty Years in Radiation Therapy Department of Bellevue Hospital, New York City. I. I. Kaplan and R. Rosh.—p. 583.
*Subacromial Bursitis: Clinical and Roentgen Observations. H. A. Olin.—p. 593.
Significance of Calcification for Roentgen Diagnosis of Aneurysm of Abdominal Aorta. E. W. Klinefelter.—p. 597.
Therapeutic Radiology. G. W. Holmes.—p. 602.
First Fifty Years of Radiology in America: Elements Which Have Contributed to Its Growth as Medical Specialty. A. C. Christie.—p. 608.

Roentgen Diagnosis of Duodenal Ulcer.—Brown and Harper state that the fluoroscopic and roentgenographic study of the stomach and duodenum in the right lateral horizontal position has proved to be useful in arriving at a more accurate knowledge of the condition of the duodenum than can be obtained from the frontal projection alone.

Radiation Therapy in Cancer of Breast.—Kaplan and Rosh's patients belonged to three groups: those who come directly into Bellevue Hospital for a primary breast condition, those referred by other hospitals or physicians for irradiation following surgical procedures or for irradiation for recurrences or metastases, and those sent for custodial care. This report covers an additional 603 cases, bringing the total for a twenty year period to 833. The authors conclude that irradiation is a valuable adjunct to surgery in the treatment of breast cancer. The best results are achieved after early diagnosis, with preoperative irradiation, surgery and postoperative irradiation. Surgery should follow within three weeks after preoperative irradiation has been administered. X-ray therapy administered after surgery is of value in alleviating distress and in prolonging life. Endocrine therapy has proved of little value in the control of breast cancer or its metastases. Since breast cancer associated with pregnancy offers a poor prognosis, the authors advocate sterilization of young women with breast cancer.

Subacromial Bursitis.—Olin thinks that trauma is the cause of subacromial bursitis in the great majority of cases. In minor injuries x-ray examination affords little or no information. With fractures of the greater tuberosity, or comminuted fractures of the head of the humerus, there is a possibility of subsequent involvement of the bursa. The gap in the contour of the greater tuberosity left by a tear of the supraspinatus tendon invariably involves the bursa. As the condition grows older, calcium deposits occur in the bursal sac. These vary in size from fine granules of sand to large irregular calcium deposits which may fill the sac beneath the deltoid muscle and even extend to that portion beneath the acromion process. The presence of calcareous deposits in the soft tissue usually form the main criterion for an x-ray diagnosis. Stereoscopic views and oblique projections may be necessary for better visualization. In many cases roentgen therapy directed to the bursa will relieve the acute pain.

Southern Surgeon, Atlanta, Ga.

13:1-58 (Jan.) 1947

Intrathoracic Metallic Foreign Bodies: Review of Literature. E. C. Drash.—p. 1.
*Muscular Relaxation in Abdominal Surgery with Use of Pentothal-Oxygen and Curare: Report of over 600 Cases; Preliminary Report. T. C. Davison and A. H. Letton.—p. 15.
Evaluation of Thiouracil in Treatment of Hyperthyroidism. M. N. Foote.—p. 23.

Pentothal-Oxygen-Curare.—Davison and Letton have compiled the pertinent facts of 609 major operations in which pentothal-oxygen-curare anesthesia was used. For comparison they also compiled statistics on a corresponding group of patients given pentothal alone. The addition of curare diminished the amount of pentothal used by 19.3 per cent, thus allowing patients to undergo even the largest operations without the attendant dangers of deep anesthesia necessary without curare. The authors prefer the synergistic effects of pentothal-oxygen-curare in abdominal surgery over spinal, cyclo, nitrous ether or local, either alone or in combination with other agents, including curare, for the induction is rapid, the effects pleasant for the patient—postoperative complications are lowered, the danger of explosion minimized and postspinal headaches eliminated. Curare should not be used in myasthenia gravis or when the anesthetist cannot give artificial respiration. The inexperienced user of curare should proceed with the utmost caution. Curare is a valuable adjunct to anesthesia when muscular relaxation is necessary.

Tennessee State Medical Assn. Journal, Nashville

39:433-468 (Dec.) 1946

The Plot Behind Sickness Insurance. A. L. Conrad.—p. 433.

40:1-32 (Jan.) 1947

New Method for Ambulatory Treatment of Poison Ivy Dermatitis. F. G. Witherspoon.—p. 1.
Primary Atypical Pneumonia: Review of Recent Literature. W. A. Hensley Jr.—p. 3.
Heart Block.—R. B. Wood.—p. 11.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

20:1-44 (Jan.) 1947

Basis for Staffing of Department of Diagnostic Radiology. S. W. Davidson.—p. 1.
Primary Malignant Tumors of Bone. S. Cade, R. W. Scarff, F. C. Golding and B. S. Adams.—p. 10.
Influence of X-Ray Measurements on Pelvic Brim Index. O. S. Heyns. —p. 31.
Slide Rule for Gamma-Ray Dosage Calculations. F. S. Stewart.—p. 34.
Further Observations on Radiologic Diagnosis of Lumbar Intervertebral Disk Lesions. H. W. Gillespie.—p. 37.
Foreign Bodies in Esophagus: Technical Note on Radiologic Examination. A. S. Johnstone.—p. 41.

British Medical Journal, London

1:1-40 (Jan. 4) 1947

Review of Dietetic Factors in Liver Disease. L. J. Witts.—p. 1.
Observations on Plague Meningitis. D. Landsborough and N. Tunnell. —p. 4.
*"Sulfa-Combination"—New Chemotherapeutic Principle. A. R. Frisk, G. Hagerman and S. Helander and B. Sjögren.—p. 7.
Endogenous Depression in General Practice. C. A. H. Watts.—p. 11.
*So-Called Triple-Symptom Complex of Behcet. E. W. P. Thomas.—p. 14.

Sulfa-Combination—A New Chemotherapeutic Principle.—Frisk and his associates discuss the problems connected with the application of the "sulfa-combination principle." The mixture prepared according to this principle is "sulfadital" and contains the three compounds sulfathiazole, sulfadiazine and sulfamerazine. The authors describe the results of a number of experiments illustrating the practicability of the method. The importance of the sulfa-combination method is twofold: It appears to eliminate the risk of concrement formation at a normal dosage and makes it possible in cases with more resistant bacteria to increase the dosage considerably without greater risk of calculus formation than is possible with a single compound.

Behcet's Syndrome.—Thomas points out that Behcet in 1937 described a hitherto unrecognized morbid entity in which grave eye disease occurs in association with peculiar ulcers of the mouth and external genitals. The clinical picture is dominated by the eye lesions, which range from conjunctivitis and corneal ulceration to hypopyon uveitis and may lead to total blindness. The eye involvement may precede, coincide with or follow the oral and genital manifestations. The two eyes may be affected simultaneously, but more usually only one eye is involved for a while; after a variable interval the other eye shows similar changes. The ulcers of the mouth and genitals are small and discrete, either aphtha-like or nodular and necrotic. A similar combination of symptoms had been reported earlier by Whitwell in 1934 and Nishimura in 1935. The author describes a case which he thinks is the first to be reported in Britain.

Journal of Tropical Medicine and Hygiene, London

50:1-20 (Jan.) 1947

Comparative Study of Therapeutic Effects of Some of the Drugs Used in Treatment of Amebic Dysentery. G. A. Rail.—p. 3.
*Pleurisy Due to Amebiasis. L. B. Carruthers.—p. 12.
Jaundice in Acute and Severe Infections in the African. M. Gelfand. —p. 15.

Pleurisy Due to Amebiasis.—Carruthers states that a plastic pleurisy or pleurisy with effusion without involvement of the lung, associated with amebic hepatitis and not necessarily with abscess of the liver, is a common occurrence, the amebic hepatitis often being of such a mild nature as frequently to be overlooked. A series of 5 representative cases is reported to bring out the salient facts on which the diagnosis of this syndrome can be based. The important diagnostic points are the presence of liver enlargement, of liver tenderness to heavy fist percussion, of a history suggestive of amebic colitis or of Endameba histolytica in the stools, of the presence of an irregular, sluggish or high right diaphragm on fluoroscopy, and the absence of any indication of tuberculosis. The author thinks that any of these findings in the presence of pleuritis or of pleurisy with effusion justifies a trial of antiamebic therapy for the treatment of the pleuritis.

Lancet, London

1:1-48 (Jan. 4) 1947

The Meaning of Normal. J. A. Ryle.—p. 1.
Impending Death Under Anesthesia. H. Bailey.—p. 5.
*Clinical and Pharmacologic Aspects of Toxicity of Streptomycin. D. G. Madigan, P. N. Swift and G. Brownlee.—p. 9.
*Cerebral Beriberi: (Wernicke's Encephalopathy): Review of 52 Cases in Singapore Prisoner-of-War Hospital. H. E. de Wardener and B. Lennox.—p. 11.
Low Blood Pressure Phases Following Hemorrhage. S. Howarth and E. P. Sharpey-Schafer.—p. 18.
Agglutination of Leptospirae. A. D. Gardner.—p. 20.
Penicillin in Proteus Septicemia: Report of Case. R. Irene Hutchinson and K. J. Randall.—p. 22.

Toxicity of Streptomycin.—Madigan and his associates report the results obtained from the examination of animals and man of the pharmacologic effects of 17 batches of streptomycin. This material, though of varying purity, was free from histamine-like substances and, with one exception, antidiuretic substances; moreover, a simple relation has been found between potency and toxicity. This is in contrast to the observations previously published, which difference may be attributed to biologic variations which exist in the preparation of natural antibiotics, much as the choice of medium and the method of extraction. A graph relating toxicity and potency reveals the presence of a hitherto uncharacterized substance more toxic than pure streptomycin. This may be a toxic material present in low concentration or a second streptomycin of acute toxicity to mice. Fourteen patients have been treated systematically with these batches. The toxic manifestations were trivial.

Cerebral Beriberi (Wernicke's Encephalopathy).—De Wardener and Lennox point out that Wernicke described in 1881 fatal cases of ataxia, ophthalmoplegia and clouding of consciousness which he called acute superior hemorrhagic polioencephalitis. Subsequent descriptions emphasized the association with alcohol. From 1933 onward a deficiency origin began to be suspected, and more recent clinical and experimental work has pointed to vitamin B_1 deficiency as the principal factor. There were 52 cases of Wernicke's encephalopathy in a Japanese prisoner-of-war camp; 30 of the patients recovered. The early diagnosis, based on anorexia, vomiting, nystagmus and emotional changes before the onset of gross mental and eye changes, is emphasized. Early treatment with thiamine injections cured rapidly and completely. Acute thiamine deficiency appears to be the sole cause of the syndrome. The name cerebral beriberi is suggested.

Medical Journal of Australia, Sydney

2:825-856 (Dec. 14) 1946

Epidemiology Today. F. M. Burnet.—p. 825.
Development of Clinical Pathology. Lucy M. Bryce.—p. 830.
Cervical and Thoracic Intervertebral Disk Disease. J. H. Young. —p. 833.
Epidemic Keratoconjunctivitis in Australian Troops: Report on 56 Cases in Northern Queensland. J. Hercus.—p. 838.

2:857-888 (Dec. 21) 1946

Routine Testing for Rh Factor in Midwifery Hospital. Vera I. Krieger, Barbara Liddelow and Sara Weiden.—p. 857.
*Further Report of Epidemic of Acute Polyarthritis. G. Goswell.—p. 861.
Surgical Ballistics. F. V. Stonham.—p. 863.

Epidemic of Acute Polyarthritis.—Goswell says that during the past few years attention has been drawn to a condition characterized by painful, swollen joints, lymphadenitis and a transient exanthem, to which the term "acute polyarthritis" has been applied. Outbreaks occurred among troops stationed in the north of Australia. The author reviews observations on 51 patients, of whom he was one. Six weeks beforehand, in the Darwin area, several cases of what was at first believed to be dengue were recorded; but as the condition developed it was considered that these also were cases of acute polyarthritis. The outbreak commenced suddenly, 34 cases developing within the

first ten days. All 51 had been recorded within thirty days. The possibility of this being an insect borne disease was considered, but no definite indications were found. The duration of the illness ranged from a few days to several weeks. More than 90 per cent of the men receiving treatment as outpatients had completely recovered by the seventh day. In a number of cases, however, residual stiffness persisted. In all except 1 case this stiffness had cleared within four weeks.

Tubercle, London

28:1-20 (Jan.) 1947

*Recent Experiences with BCG Vaccination in Norway. G. Hertzberg.—p. 1.
Tuberculosis in Egypt. M. S. Abaza and A. Sami.—p. 10.

BCG Vaccination in Norway.—Hertzberg says that from 1940 on when war and occupation engulfed Norway, most authorities on tuberculosis felt that greater use should be made of BCG vaccination. Records show that between 42,000 and 43,000 people were vaccinated in Norway during the war, but the correct figure is probably nearer 60,000, since many doctors omitted to send in their returns. Tuberculin-positive results were commonly reported to be as low as 50 per cent among the BCG vaccinated. Investigations on the cause of this decline are presented. The Norwegian war tuberculin from the end of 1943 and up to the present time seems a little weaker than the prewar tuberculin. This drop in potency is too small to be of statistical importance if one uses the strong Mantoux test with 1 mg. of tuberculin; on the other hand the weakening is of practical importance when tuberculin tests are carried out, using only the weak test, a single Pirquet test. Those who, in their control of the BCG vaccinated, use only the Pirquet test must be disappointed with their positive results. Although BCG vaccination does not give 100 per cent protection against tuberculosis, it does give from 75 to 90 per cent protection. Its use is justified in conjunction with other measures in the campaign against tuberculosis.

Schweizerische medizinische Wochenschrift, Basel

76:1123-1146 (Nov. 2) 1946. **Partial Index**

Importance of Weight Determination of Choriogonadotropin for Diagnosis of Pathologic Pregnancy. O. Kaeser.—p. 1123.
*Niemann-Pick Disease Within the Group of Lipoidoses. U. Pfandler.—p. 1128.
Digestive Tract and Vitamin Deficiencies: Critical Study. L. M. Sandoz.—p. 1131.
Technic of Continuous Registration of Microbic Growth Curve by Microbiophotometer. M. Faguet.—p. 1135.
*New Investigations on Notalysine, a Factor Distinct from Penicillin. Suzanne Hutter.—p. 1138.

Niemann-Pick Disease and the Lipoidoses.—Pfandler reviews observations on 14 members of a family in which 2 brothers died with Niemann-Pick disease at the ages of 29 and 33 years respectively. These cases demonstrate that Niemann-Pick disease is not exclusively a disease of infants and young children. A genealogical tree of the family illustrates diagrammatically the various forms in which Niemann-Pick disease became manifest. Eight members exhibited microsymptoms indicative of a disturbance in the lipoid metabolism. Hepatosplenomegaly with phosphatides can persist in the latent stage and cause little disturbance. The author believes that the latent forms of Niemann-Pick disease are possibly more frequent than is generally believed. The transmission of the disease seems to be irregularly dominant, with a tendency to more pronounced manifestation in the male sex. The primary cause of the disease is obscure.

New Investigations on Notalysine.—Hutter described in a previous report the phenomenon of staphylococcic lysis by filtrates of Penicillium notatum Westling. This bacterial lysis has been attributed to a substance designated as notalysine, which is elaborated by the fungus when it has a medium that is rich in yeasts and buffered by phosphates. The substance is insoluble in acetone and alcohol, partially soluble by chloroform and sulfuric ether and completely soluble in petroleum ether. Although the available information about notalysine does not permit its chemical identification, results so far indicate that it should not be confounded with penicillin. Penicillinase has no antagonistic effect whatever on notalysine. Notalysine is an initiator of bacteriolysis, considered by the author an antemortem anticipation of autolysis. The coordination of the play of enzymes, a sign of life, can perhaps be broken by a failure of one of the coordinated factors. Science has not yet identified this failure. It is possible that the recognition of its antagonist, the initiator of bacteriolysis, will contribute to this identification and bring the first light into the obscure problem of cytolysis.

Revista Chilena de Pediatria, Santiago

17:655-732 (Oct.) 1946

Experience with Penicillin. R. Ortega and J. Rojas.—p. 655.
*Hepatobiliary Complications of Typhoid in Childhood. Haydee Sepulveda de Borquez and Zoila Fuentes Acevedo.—p. 667.
Syndrome of Mikulicz. M. Sepulveda R.—p. 691.

Hepatobiliary Complications of Typhoid During Childhood.—Sepulveda de Borquez and Fuentes Acevedo say that among the 225 cases of typhoid treated in a children's hospital between 1941 and 1946 icterogenic hepatitis was present in 10 and acute cholecystitis in 3. One of the latter was accompanied with angiocholitis. Four of the cases of icterogenic hepatitis appeared during the first fifteen days of typhoid. In 3 of these the complication did not greatly influence the course of the typhoid, which was rather mild. The jaundice and hepatomegaly which characterized the complication were mild and disappeared in from eight to fifteen days. In 1 of the cases death occurred a few hours after hospitalization. In the remaining 6 the complication appeared after the fourth week of typhoid. This group of cases of hepatitis in the convalescence of typhoid was usually characterized by long duration and greater severity than the cases of the first group. Laboratory tests revealed increased bilirubinemia in all cases in relation to the degree of jaundice. In cases in which liver tests were made, impaired function was evident. Treatment consisted in a carbohydrate regimen in which sugar solution was given by injection and by mouth. In some cases liver extract was given and in others choline syrup.

Revista Médica de Chile, Santiago

74:661-738 (Oct.) 1946

*Blood Proteins in Infectious Hepatitis. R. Armas-Cruz, E. Montero, J. Cabello and G. Lobo-Parga.—p. 661.
Primary Atypical Pneumonia of Unknown Etiology. R. Valdivieso, G. Sepulveda and E. del Campo.—p. 670.
Latent Syphilis and Persistent Serologic Reactions. F. Prats G.—p. 676.
Dextrocardias. C. Viviani C., G. Dussaillant G. and E. Bellolio.—p. 681.
Statistical Study of Tuberculous Meningitis. J. Schwarz.—p. 691.

Blood Proteins in Infectious Hepatitis.—Armas-Cruz and his associates studied the total protein content and the albumin and globulin fractions in 29 normal serums and in 111 serum specimens from 84 patients with infectious hepatitis. They found that during the infectious stage of hepatitis there was no significant variation in the total protein figure; there was a slight decrease in the albumin figure and a clear augmentation in the quantity of globulins; that is, there was an inversion of the albumin-globulin quotient. There is a relationship between the intensity of the flocculation of the cephalin-cholesterol emulsion, the colloidal gold reaction and the figures for blood protein, serum albumin and globulin and the albumin-globulin quotient. Although the relationship between these factors is not exact, in cases in which the albumin-globulin quotient is greatly altered the flocculations are usually more pronounced than when the albumin-globulin quotient is normal or only slightly changed.

Revista Médica Cubana, Havana

57:681-762 (Sept.) 1946

Chemotherapy of Oxidation and Reduction in Treatment of Tuberculous Pulmonary Cavities. J. F. Baldor.—p. 681.
*Treatment of Typhoid by Vi Antigen. C. Fernández Brito, J. Román Crespo and A. Curbelo Hernández.—p. 702.
Curious Histologic Aspect of Thyroid in Presence of Undifferentiated Epithelioma of Lung. Z. Marinello Viudaurreta.—p. 715.

Vi Antigen in Treatment of Typhoid.—Fernández Brito and his associates used the Vi antigen prepared by the technic of Luippold in a concentration of 2,000 units per cubic centimeter on alternate typhoid patients, those with uneven numbers being treated with the antigen and those with even numbers serving as controls. In the 71 cases treated with from two to five injections of 0.1 cc. they observed psychic improvement and some shortening of the febrile period. The mortality was

4 per cent in those injected with the Vi antigen and 15 per cent in the controls. Treatment with progressive doses of the antigen resulted in detoxication of the patient, regardless of whether the patient was treated early or late. In those treated early the febrile period was shortened. The total number treated with the progressive doses was 56; their mortality was 3.57 per cent.

Revista Médica de Rosario

36:511-570 (Sept.) 1946. **Partial Index**

*Medullary Hypoplasia (Agranulocytosis). C. Alvarez and T. C. Minnhaar.—p. 542.

Medullary Hypoplasia (Agranulocytosis).—The subject of this report was a man aged 50 who was normal up to the age of 48, when he began to suffer from articular pain and icterus, and he became easily tired and rapidly lost weight. The spleen was enlarged. A diagnosis of agranulocytosis was made as a result of the hematologic examination and the examination of medullary material obtained by sternal puncture. The treatment consisted in administration of injections of liver extract, iron and arsenic preparations and vitamins. The blood improved in the course of the therapy but, a final intercurrent infection occurred. The disease in the reported case seemed to be due to chronic silver nitrate poisoning from the use of a hair dye by the patient.

Wiener klinische Wochenschrift, Vienna

58:709-724 (Nov. 29) 1946. **Partial Index**

Psychiatric Instruction in the Medical Curriculum. O. Kauders.—p. 709.
Irradiation of Hypophysis in Menopausal Disorders. A. Kotek.—p. 714.
*Amaurosis in Perforated and Bleeding Duodenal Ulcers. D. Forgarasi.—p. 716.
Late Sequels of Oral Lesions Caused by Caustic Substances. P. Adler and I. Jakabfi.—p. 717.

Amaurosis in Perforating and Duodenal Ulcer.—Forgarasi observed blindness in a man aged 49 with bleeding and perforated duodenal ulcer. The patient had had gastric disturbances almost constantly since 1940. Blindness following loss of blood has received little attention in the surgical literature, but the ophthalmologic literature reports a considerable number of such cases. In men, usually of the fourth and fifth decade of life, it is generally hemorrhages in the gastrointestinal tract that are responsible for this form of blindness. In women, however, this form of amaurosis is usually observed after profuse loss of blood incident to childbirth or abortion. Amaurosis has been observed also after venesection. The degree of visual disturbance varies, but loss of vision is usually complete. For the treatment blood transfusions have been recommended, but also liver and iron preparations as well as acetylcholine and strychnine. The prognosis is usually unfavorable.

Harefuah, Tel-Aviv

No. **2**:1-60 (Nov.) 1946

Sterility in Women. B. Zondek.—p. 3.
Remittent Rural Fever: (Febris Remittens Agricolarum). J. Yatom.—p. 22.
Huet-Pelger Anomaly of Nuclei of Leukocytes in Jewish Family in Palestine. L. Nelken.—p. 32.
*Dermatitis Among Workers Employed in Citrus By-Product Industry. M. Seidmann.—p. 39.

Dermatitis in Citrus Industry.—Seidmann says that workers who come into contact with the different parts of citrus fruits may develop paronychia, necrosis or dermatitis. Paronychia develops because the juice and the moisture foster the growth of fungi, which are probably the causative agent. Necroses or "holes" are slowly healing ulcers, seen among those engaged in peeling. Here there is the double effect of cutting with the knife and the caustic action of the juice and of the peeling. Discussing dermatitis, the author says that the most important part from the standpoint of irritation is the extract of the peel, i. e. the ethereal oil. Observations reported here were obtained in visits to factories and fruit groves and in studies on 40 cases of dermatitis. It is most prevalent among young people, women and European Jews. The texture of the skin seems to be a factor. As to the kind of fruit, most of the cases were among those coming in contact with lemons; second in order were bitter oranges, then grapefruit and finally oranges. Those handling the peels and employed in the expression of the ethereal oil are most affected. The author further discusses the varieties of eruption, the results of patch tests on patients and protective measures.

Acta Dermato-Venereologica, Stockholm

27:83-172 (No. 2) 1946

Disturbance of Pigmentation in a Half Caste: Riehl's Melanosis. Poikiloderma of Civatte. L. Spira.—p. 83.
*Tuberculous Primary Infection of Genitalia: Two Cases of Venereal Genital Tuberculosis. R. Bjørnstad.—p. 107.
Clinical Features of Over 1,200 Syphilitic Chancres and Chancroids and Over 140 Cases of Lymphopathia Venerea. R. D. G. P. Simons. p. 115.
*Increasing Chemoresistance in Gonorrhoea. O. Nørgaard.—p. 123.

Tuberculous Primary Infection of Genitalia.—The first of the 2 cases of primary tuberculous infection of the genitalia reported by Bjørnstad concerned a previously Pirquet negative woman aged 21 in whom tubercle bacilli were found not only in the pus from an inguinal fistula but also in a lesion on the left labium. She had had intercourse with a man who had tuberculous epididymitis. The second patient was a man aged 32 who had been Pirquet negative. He developed a swelling of the lymph nodes in the right groin and two weeks later a slightly indurated preputial ulcer. His wife had a tuberculous salpingo-oophoritis, and her menstrual blood was found to contain tubercle bacilli. The author stresses that the possibility of tuberculous primary infection ought to be considered in obscure cases of genital ulcer with involvement of the regional lymph nodes.

Increasing Chemoresistance in Gonorrhea.—Nørgaard reviews the Scandinavian literature on chemoresistance in gonorrhea. He finds that practically all authors agree that chemoresistance is increasing in the Scandinavian countries. He reports observations in 1,487 cases of gonorrhea that were treated with sulfathiazole in the outpatient department of Rudolph Bergh's Hospital in the years 1944, 1945 and 1946. It has been found that for the past three years there has been no further increase of the chemoresistance; it now remains stationary, in men at 60 to 65 per cent and in women at 45 to 50 per cent. Chemotherapy gives better results in women than in men. Chemotherapy gives better results in older than in younger persons.

Acta Medica Scandinavica, Stockholm

126:97-264 (Nov. 9) 1946. **Partial Index**

Investigations of Epinephrine Concentration in Blood: V. Commentaries on Formation of Epinephrine and Its Physiologic Mission (Epinephrine-problem). M. Kobro.—p. 97.
Enigma of Renal Iodine Excretion, Together with Remarks on Reserve Capacity of Kidneys. G. Ekehorn.—p. 117.
Penicillin Treatment of Subacute Bacterial Endocarditis. M. Trier.—p. 140.
Electrocardiogram in Derangements of Organism's Water and Electrolyte Metabolism. O. J. Broch.—p. 157.
Relation of Neurocirculatory Dystonia to Essential Hypertension, Angina Pectoris and Peptic Ulcer. P. Brummer.—p. 177.
*Bronchial Asthma Caused by Sulfathiazole. M. Rosberg.—p. 185.
Calculation of Urea Clearance with Varying Degrees of Urine Concentration. J. Bing.—p. 199.
Clinical Results Obtained by Use of Sulfamethylpyrimidine (Perocoide). P. van der Meer.—p. 224.
*Neostigmine in Treatment of Muscle Spasm in Rheumatoid Arthritis. T. Wramner.—p. 241.

Bronchial Asthma Caused by Sulfathiazole.—Rosberg reports the histories of 2 nurses, both of whom were exposed to sulfathiazole powder in the course of their daily work. Both developed typical attacks of asthma. At the same time eosinophilia could be registered in the blood. Epicutaneous tests with sulfathiazole were negative, but positive reactions were obtained with 2-aminothiazole hydrochloride (in both cases) and acetylsulfanilchloride (in 1 case), substances probably formed by the decomposition of the sulfathiazole in the organism. These reactions are possibly caused by a sensitization of the skin for these elements. There exists, however, also a possibility of allergy to a whole group of chemically related elements.

Neostigmine in Muscle Spasm in Rheumatoid Arthritis.—Wramner investigated the relaxing effect of neostigmine on muscle spasm in 25 patients with rheumatoid arthritis and associated conditions. The neostigmine was administered subcutaneously in doses of from 0.25 to 1.25 mg. once daily. In 21 of the 25 patients there resulted a decrease in muscular pain, muscle rigidity and pain on movements, and an increase of mobility was observed. The effects appeared within ten to twenty minutes after the subcutaneous injection and lasted up to fourteen hours. Neostigmine probably causes this effect by depressing the motor cells of the anterior horn.

Book Notices

The X-Ray Treatment of Accessible Cancer. By D. Waldron Smithers, M.D., D.M.R., Director of the Radiotherapy Departments, The Royal Cancer Hospital (Free) and the Royal Free Hospital, London. Cloth. Price, $8.50. Pp. 147, with 116 illustrations. William Wood & Co., Mt. Royal & Guilford Aves., Baltimore 2, 1946.

This book is a first edition written by a well known English radiologist and therapist. The author has selected those cancers which are easily accessible for direct irradiation with roentgen rays, namely cancer of the skin, genitalia, mouth and other body cavities, and those in sites rendered accessible by surgical exposure, excluding the breast. He shows wise discretion in such a selection, for this is one branch of roentgen therapy in which the results are beyond question. The author emphasizes the point that, although some cases of accessible cancer should be treated by irradiation alone and others by surgery alone, there are many others in which irradiation and surgery complement each other. He also mentions that radium may be of equal value in some of the conditions described but confines his discussion entirely to the use of roentgen rays.

The author presents a concise and comprehensive description of the equipment and apparatus available at present for the treatment of accessible cancer. He also details the classification, staging, records and assessment of results of therapy. The procedure of biopsy, particularly serial biopsy, during treatment, with special reference to cell counts, is evaluated both for the given case under treatment and for future use in determining the response of various tumors to irradiation so that eventually a more definite tumor dose may be established for these cancers.

The author's grouping of accessible cancers according to their locality rather than their histologic origin will be a helpful and handy reference in everyday practice. The text covers the parts of the body where accessible cancers are found, including in each description the frequency of various types of cancer in each locality, the clinical diagnosis, differential diagnosis, pathologic and histologic findings, the treatment of each type and evaluation of results of treatment.

The chapter on the use of roentgen therapy in the treatment of cancers made accessible by surgical exposure lays open to the imagination the future possibilities for treatment by direct irradiation of these previously "internal," inaccessible cancers. The inadequacy of treatment of internal cancers has not been entirely the resistance of the tumors to irradiation but the inability to deliver sufficient irradiation without irreparably injuring normal tissues. There are also technical difficulties, particularly the difficulty of directing the incident beam so that it correctly falls on the tumor under treatment.

The book contains a summary of the literature and descriptions of the generally accepted technics. Among its finest features are its illustrations in colored and black and white reproductions showing lesions before, during and after treatment. It well deserves a place in the library of every therapist.

Peptic Ulcer: Its Diagnosis and Treatment. By I. W. Held, M.D., F.A.C.P., Attending Physician, Beth Israel Hospital, New York, and A. Allen Goldbloom, M.D., F.A.C.P., Assistant Clinical Professor of Medicine, New York Medical College and Flower-Fifth Avenue Hospital, New York. Cloth. Price, $6.50. Pp. 382, with 110 illustrations. Charles C Thomas, 301-327 E. Lawrence Ave., Springfield, Ill., 1946.

The selection of the title for this book is probably unfortunate. While peptic ulcer is a convenient term, it does not convey a precise meaning. The foreword states that the phrase as used includes ulcers found in that portion of the intestinal tract extending from the esophagus to the jejunum inclusive as well as in Meckel's diverticulum. But as might be expected the greater portion of the book is devoted to a discussion of ulcers of the duodenum and stomach. The distinction between gastric and duodenal ulcer should be sharply drawn. It is better to speak of duodenal ulcers and benign gastric ulcers as two separate entities. There is, of course, no place for the medical management of a malignant ulcer, a fact which in itself sets off the ulcer in the stomach from that in the duodenum. The authors also divide ulcers into simple and complicated types. Since the catastrophes due to ulcers are ordinarily the results of complications regardless of the site, the choice of this division is therefore not the best. The use of the term "catarrh" for gastritis is unscientific.

The subject matter is divided into chapters on pathogenesis, pathology, diagnosis and treatment. Roentgen diagnosis is well described. Various forms of medical treatment of ulcer are thoroughly discussed. Surgical treatment is briefly outlined, including the complications. The writers minimize the importance of removing the pylorus, and one feels that the concepts of surgical treatment of the past decade are not well presented. Thus there is no mention of vagotomy. Some errors are noted. The insulin effect on the vagus centers will increase rather than decrease gastric acidity. There is nothing mysterious about the tetany associated with vomiting in severe pyloric obstruction. It should be presented as a straightforward alkalosis tetany, and it does not carry with it a mortality of seventy per cent in spite of treatment. The modern knowledge of fluid and electrolyte replacement deserves a more scientific elucidation. The clinical experience of the authors is evident, and there is much of wisdom in their description of the clinical phases of the problems associated with ulcers.

With the passage of sufficient years since x-ray diagnosis of ulcers of the stomach and duodenum became established, the medical management of these lesions has come to need a thorough statistical analysis. Then we may have answers to the questions What is the recurrence rate of medically treated ulcers? and What is the incidence of complications following supposedly adequate medical management? Then the rationale of treatment, whether medical or surgical, can find itself on a firm basis.

The Cultivation of Viruses and Rickettsiae in the Chick Embryo. By W. I. B. Beveridge and F. M. Burnet. Medical Research Council, Special Report Series No. 256. Paper. Price, 2s. Pp. 92, with 10 illustrations. His Majesty's Stationery Office, York House, Kingsway, London, W. C. 2, 1946.

This publication is a revision and amplification of a previous monograph by one of the authors (Burnet) published in 1936. It constitutes therefore a helpful though brief review of published results of the use of the chick embryo method during the intervening period of ten years. The introductions to the two monographs are quite similar, covering mainly the history of the method, the management of eggs before inoculation, development of the embryonic membranes of the chick and procedures for inoculating the chorioallantois. In addition, the present report describes several new methods of inoculation that have been usefully employed by various investigators for special purposes, including procedures for amniotic, allantoic, yolk sac, intravenous, intracerebral and other routes of inoculation. Likewise successful inoculations of human skin, amnion and chorion grafted on the chick chorioallantois, especially for studies of certain viruses to which the chick embryo is insusceptible, are described. The twelve pages of references, in contrast to the one and one-half pages of the first publication, indicate the numerous contributions that have been made by means of the chick embryo method during the past decade. The authors refer to these accessions adequately though briefly in their chapter (v) on the cultivation of individual viruses and rickettsias.

Ten years ago Burnet listed fifteen viruses that had been successfully cultivated in the chick embryo. In the present report the cultivation of thirty-seven viruses is described, including in the late additions such agents of human disease as the viruses of smallpox, yellow fever, rabies, St. Louis and Japanese B encephalitis and mumps. The usefulness of the method for preparing vaccines is emphasized, especial attention being devoted to vaccines against influenza, yellow fever, equine encephalomyelitis, fowlpox and laryngotracheitis of fowls—now processed extensively from infected chick embryos. In the 1936 report brief reference was made to successful cultivation of the rickettsias of typhus and Rocky Mountain spotted fever in the chorioallantois. In the meantime the method of cultivation by inoculation of the yolk sac was developed by Cox and by this means a variety of rickettsias can now be grown in quantity, and vaccines from this source have been prepared against epidemic and murine typhus, Rocky Mountain spotted fever, Q fever, boutonneuse fever and Tobia fever. The development and use of these methods is adequately treated. In the earlier treatise, except for a brief mention of the cultivation of the micro-organism of bovine pleuropneumonia, no consideration was given to the cultivation of bacteria and other micro-organisms

in chick embryos. In the intervening period the method has been extended to studies of infection by bacteria, fungi and protozoa. As a result, early stages of infection by such microorganisms as Hemophilus pertussis, Bacterium tularense, the Brucella strains, Pasteurella pestis and meningococcus have been studied in investigations of pathogenesis.

Recently the causative agent of granuloma inguinale (Donovania granulomatis) was grown by yolk sac inoculation and identified for the first time by Anderson. Brief accounts of these applications of the chick embryo method are included in the report. The authors have not been sufficiently impressed by the importance of histologic, and especially cytologic, aspects of lesions induced in embryos by the various agents used, and in this respect nothing more has been contributed by the present publication than was contained in Burnet's monograph of 1936. The question is still left in doubt by the authors as to the regular occurrence in embryonic lesions of specific intracellular inclusions in such infections as vaccinia and herpes simplex, in which careful studies have demonstrated these structures in characteristic detail.

Since publication of the monograph under consideration there has appeared the important series of studies by Dr. Shope and his associates concerning the cultivation of the virus of rinderpest in developing hen's eggs and the preparation of an effective vaccine from this source by means of an attenuated strain of the virus resulting from repeated egg passages. The great importance of the chick embryo for studies of pathogenesis and for elucidating the cell-parasite relationship receives little or no consideration, but the extensive bibliography will be very helpful to those who wish to use the chick embryo method for experimental investigations.

Ernährungsprobleme in Mangelzeiten: Die schweizerische Kriegsernährung 1939-1946. Von Prof. Dr. med. Alfred Fleisch, Ordinarius für Physiologie und Direktor des Physiologischen Institutes an der Universität Lausanne. Cloth. Price, 32 Swiss francs. Pp. 518, with 35 illustrations. Benno Schwabe & Co., Klosterberg 27, Basel 10, 1947.

This book summarizes the nutritional experiences of Switzerland from 1939 to 1946 as seen by the national commission on wartime food controls. While the text is in German, each of the fifteen chapters includes a summary in French. In addition to a priceless fund of quantitative facts there are interesting discussions of the psychology of rationing, black markets, rich and poor refugees, and so on. The facts corroborating Hindhede's controverted report that about 60 Gm. of protein is an adequate daily allowance for adults are summarized on page 269. Statistics on diabetes are analyzed and lead to the conclusion (p. 381) that the incidence of this disease is influenced more by income level than by any other factor. Facts and explanations regarding the undeniable decrease in dental caries in children during the war are summarized on pages 459-463. The foregoing examples have been taken at random to illustrate the interesting and important nature of the contents; there are few theoretical or practical areas in the field of nutrition that are not enriched by the facts which the author presents, and no physiologist or biochemist can afford to remain in ignorance of this work.

Scoliosis: The Practical Approach to Treatment. By Beatrice Woodcock. Cloth. Price, $2. Pp. 111, with 50 illustrations. Stanford University Press, Stanford University, California; Oxford University Press, Amen House, Warwick Square, London, E. C. 4, 1946.

This is a small, compact, cloth-bound volume generously illustrated with photographs, line drawings and x-rays. The author is a physical therapist whose interest in the subject of scoliosis was stimulated years earlier while she was director of physical therapy at the University of Iowa, under the direction of Dr. Arthur Steindler. The mechanics of scoliosis is explained in terms that are easily understood. The plan of treatment by exercises is based on this interpretation of the reason for the rotation and lateral curvature of the spine which is characteristic of the deformity. Although the book will be of greatest value to students and to physical therapists, there is much to be found in it which the average physician, who is daily dealing with patients affected with scoliosis, will either have never learned or have forgotten. It should be noted that x-ray record 1 *a* in the appendix is upside down. Otherwise this book has been carefully edited.

Pharmacology and Therapeutics. Originally Written by Arthur R. Cushny, M.A., M.D., LL.D. Thirteenth edition by Arthur Grollman, A.B., Ph.D., M.D., Professor of Medicine and Chairman of the Department of Experimental Medicine, the Southwestern Medical College, Dallas, Texas, and Donald Slaughter, B.S., M.D., Dean of the Medical School, University of South Dakota, Vermillion. Cloth. Price, $8.50. Pp. 868, with 74 illustrations. Lea & Febiger, South Washington Square, Philadelphia 6, 1947.

For forty-eight years Cushny's textbook in pharmacology has been recognized as one of the authoritative works in this field. The last edition prepared by Professor Cushny was the eighth, which appeared in 1924, and subsequently four editions were prepared by the Anglo-American team of Professors J. A. Gunn and C. W. Edmunds. The last edition prepared by them appeared in 1940, and the death of Professor Edmunds and the resignation of Professor Gunn necessitated the appointment of new editors. That the choice of these editors was a happy one is evidenced by the high quality of the present edition.

Because of the rapid advance of the science of pharmacology during the past seven years, the text had to be thoroughly rewritten, much old material deleted and even more new material added. The present editors succeeded in making this extensive revision without destroying the fundamental approach to the subject which was characteristic of the original author and, indeed, one can surmise that this revision is exactly in line with what Cushny would have wished.

Although all sections of the book have undergone some revision, those which have been most completely rewritten include the metals, bile and bile salts, alcohol, anesthetics both general and local, barbiturates, ergot alkaloids, hormones, vitamins, quinine and other antimalarials, hydroxyquinoline derivatives, sulfonamides, and the serums and vaccines. Among the new sections added are those on carbon monoxide, helium, BAL, meperidine hydrochloride (demerol, isonipecaine), anticonvulsants, analeptics (which were included under "volatile oils" in the twelfth edition), di-isopropyl-fluorophosphate, new sympathomimetic drugs, thiouracil, hematics, including heparin, dicumarol and fibrin products, new antimalarials, new sulfonamides, penicillin and other antibiotics, and new anthelmintics.

A number of minor criticisms and a few major ones may be directed at the present edition. One serious error was noted on page 184, where the dose of Mapharsen is given as 0.6 Gm. and which should read 0.06 Gm.

It is questionable whether the subject of counterirritation and the preparations used for this purpose deserve ten pages of text which could be well devoted to more important subjects. The discussion of the treatment of acute alcoholic intoxication includes the recommendation for strychnine injections, which are of questionable value, but omits mention of the use of the newer analeptics such as Metrazol, Amphetamine or desoxyephedrine. Nine pages are devoted to a discussion of the actions of strychnine, although the authors acknowledge its lack of therapeutic value in any of the conditions for which it has been proposed. Why, then, devote so much space to a useless drug?

The section on pentnucleotide leaves the impression that it is of value in agranulocytosis, but most authorities have concluded that it is ineffective. Furthermore, in discussing the treatment of agranulocytosis in the section on antipyretics, the authors neglect to recommend the most valuable form of treatment, namely the use of massive doses of penicillin.

The section on the sulfonamides could, perhaps, be improved by laying more stress on the adverse reactions and sensitization following local use of the drug, and on the rapid development of drug-resistant strains of organisms, particularly in the treatment of gonorrhea. The use of "units" in discussing streptomycin dosage is unfortunate, since as early as the fall of 1945 all market packages of the drug were labeled in terms of weight.

It is surprising that more information on Benadryl and Pyribenzamine is not to be found in the text, particularly in view of the good discussions on other drugs such as BAL and D.F.P., about which information was made available only recently.

Despite the criticisms offered, the volume is a valuable and competent revision of a standard textbook. Furthermore, it has the distinct advantage over other well known textbooks in pharmacology of being completely up to date. The book is printed on excellent paper and is attractively bound. It can be recommended as an excellent textbook for teaching and reference.

The Use of Research by Professional Associations in Determining Program and Policy. By Esther Lucile Brown, Director, Department of Studies in the Professions, Russell Sage Foundation. Paper. Price, 25 cents. Pp. 39. Russell Sage Foundation, Publication Department, 130 East 22d St., New York 10, 1946.

Not all of the policies and activities of an effective, progressive professional association can be determined at the conference table. Nor can they be determined solely by salaried professional staffs. The need for sound planning and careful research by a trained research staff is emphasized in this brief review, which deals principally with the methods, or lack of methods, by which the most important functions of professional organizations are carried on.

At present the main phases of association activities in which research is an important factor are professional education, enlargement of professional service, salaries and personnel policies, and structure and function of the associations. The greatest progress in research has been made in the field of professional education as exemplified in the studies made by the American Library Association, the American Association of Dental Schools and the American Medical Association. Standards of education have been raised and improved through the efforts of organizations such as these, by means of intensive research into the educational situation in their respective fields.

The author emphasizes the need for better research into the service aspect of the organization with greater stress being put on the expansion of professional service to meet more fully the needs of the population. Coordination and cooperation with comparable associations in related professions is also urged as a necessary field for study and research.

This pamphlet presents a candid view of professional associations, noting their inadequacies, commending their accomplishments and pointing out means of developing their activities and influence through scientifically planned programs. As a critical analysis it should be brought to the attention of all professional association staff members.

Experimentelle Grundlagen zu einer modernen Pathologie: Von der Zellularzur Molekularpathologie. Von P. Busse Grawitz. Cloth. Price, 32 Swiss francs. Pp. 359, with 126 illustrations. Benno Schwabe & Co., Klosterberg 27, Basel 10, 1946.

In this monograph the author describes experiments which, he thinks, refute some of the fundamental concepts of Virchow and Cohnheim with respect to the origin of cells of inflammation. By means of tissue culture or by implantation of tissues into animals, particularly tissues coated with collodion, he arrives at the conclusion that there are humoral forces which determine cell growth or regression, either stimulating or inhibiting. The book contains 120 photomicrographs and 6 colored plates, which serve as a basis for the author's conclusions. Various technics are described for the study of cellular changes which may help to elucidate obscure problems of histology and pathology, particularly the problem of cancer. The monograph will be of interest to those who wish to explore the possibility that cells do not necessarily arise from other cells but may arise from connective tissue ground substance or even from tissues from mummies.

Principles in Roentgen Study of the Chest. By William Snow, M.D., Director of Radiology, Bronx Hospital, New York. Fabrikoid. Price, $10. Pp. 414, with 508 illustrations. Charles C Thomas, 301-327 East Lawrence Ave., Springfield, Illinois, 1946.

This employs a slightly different pattern from that of the conventional textbook. The descriptions of the lesions are given in a short and abbreviated style, much as one would prepare an abstract. The author has not attempted to consider any of the excellent contributions to the study of chest diagnoses nor has he considered many of the accepted physiologic and pathologic concepts in arriving at the chest diagnoses. He does consider briefly bronchial spasm, carbon dioxide tension and lung circulation. As one studies the book the lack of reference material is apparent. The illustrations, some of which are good and some poor, have very short legends and the majority of them do not include a history. One feels the need for illustrations made in views other than many of those included. The lack of emphasis on differential diagnosis is felt throughout. Likewise the author does not include any consideration of the contribution of body section roentgenography in the diagnosis of obscure lesions. The arrangement of many of the illustrations is most unusual. Those that are arranged symmetrically are pleasing to the eye but those that are offset and which stick out into the margin are quite unusual. The index does not refer to any of the illustrations, and on turning to the subject matter one often does not find an illustration of the subject of discussion. A number of the illustrations are excellent, but there are some which do not show the lesions that the author wishes to demonstrate, and this is in spite of the fact that both space and size of illustrations are adequate.

Principles of Anatomy and Physiology for Physical Training Instructors in the Royal Air Force. Great Britain, Air Ministry, Air Publication 3125. Cloth. Price, 7s. 6d. Pp. 180, with 158 illustrations. His Majesty's Stationery Office, York House, Kingsway, London, W. C. 2, 1946.

This book attempts to explain important principles of anatomy and physiology having a direct relationship to the Royal Air Force physical training program. The approach to the problem is functional, with emphasis given to the kinesiology involved. Chapters I, II and III are devoted to the fundamental anatomy of bones, muscles and joints, while chapter IV is concerned with the basic physiology having rather direct bearing on exercise. In the remaining portions of the book one chapter is given over to a discussion of posture and corrective exercises, breathing, fitness for flying, general fitness, the instructor's part in rehabilitation and questions commonly asked by instructors. The book is essentially of manual type, having the specific purpose of furnishing a condensed overview of what a professionally prepared physical educator in this country would get in a number of undergraduate courses. Anatomy, physiology, kinesiology, physiology of exercise and corrective and adapted activities are all touched on. The majority of American teacher training institutions commonly offer these subjects as at least semester courses in the professional physical education curriculum. The section devoted to rehabilitation of surgical and medical cases describes the place of graduated exercise in the remedial program. The relations of the supervising physician and the instructor are discussed, and the need for careful and individual handling of men in various stages of illness and recovery from injury is stressed. The manual is well printed and illustrated and presents basic principles in concise form. It should prove useful in situations in which needs exist similar to those evidently found among the Royal Air Force physical training personnel.

Vitamins and Hormones: Advances in Research and Applications. Edited by Robert S. Harris, Professor of Biochemistry of Nutrition, Massachusetts Institute of Technology, Cambridge, Massachusetts, and Kenneth V. Thimann, Associate Professor of Plant Physiology, Harvard University, Cambridge, Massachusetts. Volume IV. Cloth. Price, $6.80. Pp. 406, with illustrations. Academic Press, Inc., 125 E. 23d St., New York 10, 1946.

This is the fourth volume of a series of publications on vitamins and research that has provided a useful reference source for those who seek advanced knowledge. The books are not for those who would only glimpse casually the fund of knowledge now opened by research on endocrinology and vitaminology but for those who want thorough reviews of the more intricate problems related to these special fields of science. Included in volume IV are discussions of the newer hemopoietic factors of the vitamin B complex, nutrition and resistance to infection, manifestations of nutritional deficiency in infants, effect of B vitamins on the endocrinologic aspects of reproduction, nutritional therapy of endocrine disturbances, the thyroid and diabetes, thyroactive iodinated proteins, the protein anabolic effects of steroid hormones, and methods of bioassay of animal hormones.

The chapters are well oriented and instructive and the contents presented in an interesting style in spite of somewhat voluminous detail. Each chapter is supported by many references and is divided into logical subheadings. While they will be read, unfortunately, essentially only by specialists, teachers and research workers, the discussions provide information that is of value to practically all medical students and to most practitioners. The use of vitamins and endocrines in modern medical practice requires constant study because of new concepts and advancing knowledge. Such books as the present serve a useful and helpful role by providing a source for obtaining up to date and more than casual information.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TREATMENT OF MYASTHENIA GRAVIS

To the Editor:—A patient with myasthenia gravis is getting neostigmine methylsulfate (by injection) and the bromide orally; also ephedrine. I wonder if there is anything else with which to supplement the treatment? A study of the obscure etiology suggested the use of calcium ascorbate intramuscularly to detoxify (the disease may be due to some unknown toxin) and the use of acetylcholine with or without thiamine (it may be due to a defect at the neuromuscular junction). Please give precautions to be taken, if any, when acetylcholine and thiamine are given simultaneously. Would administration of aminoacetic acid and partly predigested proteins (proteolysate, amigen) along with pyridoxine (they say pyridoxine is essential to insure a normal amino acid metabolism) be of any use?

M.D., Michigan.

ANSWER.—Neostigmine bromide in divided doses of 15 to 30 mg. each is the most efficient treatment at the present time for myasthenia gravis. The drug is usually taken by mouth, spaced throughout the day and night. For some patients neostigmine in the form of the methylsulfate as a supplemental measure is needed. The methylsulfate form is given by intramuscular injection in doses of 0.5 to 1.5 mg. Ephedrine sulfate 24 mg. is also of considerable value in the treatment of myasthenia gravis. The average dosage of the combined neostigmine and ephedrine for ambulatory cases is about ten to twelve tablets of neostigmine bromide (15 mg.) and two to three tablets of ephedrine sulfate (24 mg.) in a period of twenty-four hours. Usually the drugs are taken every two to three hours from 7 a. m. to 11 p. m.; occasionally one or two tablets may be needed at 2 a. m.

Ephedrine sulfate was the chief drug used in the treatment of myasthenia gravis before the introduction of neostigmine, and many patients were maintained in a state of reasonable health by this drug alone. It is now almost exclusively used as a secondary medication to neostigmine, being about 10 per cent as efficient as the latter drug. Ephedrine sulfate, when taken by mouth, tends to fortify, prolong and smooth out the action of neostigmine bromide. It may be given either by capsules or as tablets. Ephedrine is usually given before noon, as it frequently causes insomnia if given later in the day. Three pills of 24 mg. each is the ordinary dose, but it may be used in smaller amounts four or five times a day. Since 1935, when neostigmine bromide was first introduced, many other drugs have been used. None except ephedrine have been as efficient as neostigmine in overcoming the muscular weakness in myasthenia gravis.

Guanidine hydrochloride may be used in doses of 125 mg. three or four times a day by mouth. Toxic symptoms such as nausea, abdominal cramps, muscular twitching and paresthesias, particularly of the lips and fingertips, are not infrequently encountered. After many months patients may become more tolerant to the drug and many or all of the untoward symptoms will disappear. The drug may be used alone with a moderate degree of efficiency. When used as a supplemental drug to neostigmine, guanidine is of value in about 5 per cent of the cases treated. It is thus somewhat less effective than ephedrine sulfate. Some patients use it exclusively.

Potassium salts, like guanidine, increase the sensitivity of muscle to acetylcholine. Clinically the salts tend to prolong the effect of neostigmine, but only when used in large doses. Patients may require 10 to 12 Gm. three times a day, an amount that cannot be tolerated easily by most persons. Because the drug causes gastric distress and urinary frequency, most patients prefer not to take it over any considerable period of time. It is somewhat more palatable when added to a mixture of egg and milk.

Aminoacetic acid (glycine) in doses of 10 Gm. three or four times a day is ineffective. Even larger doses have not been of value. The drug does not have a place in the treatment of myasthenia gravis.

Calcium ascorbate, proteolysate, amigen, pyridoxine and thiamine have not been given special mention in the literature on myasthenia gravis.

Di-isopropyl-fluorophosphate produces less improvement in myasthenia gravis than does neostigmine. The dose must be limited because of the toxic effects of the drug. Two to 3 mg. intramuscularly may be given once or twice a week to supplement the effect of neostigmine.

Acetylcholine and the other derivatives of choline, acetyl-betacholine (mecholyl) and carbaminoylcholine (doryl), are unsuitable for clinical use because of their transient and variable effects. They have a similar parasympathomimetic effect to neostigmine, but when given orally the results are uncertain and if used subcutaneously the drugs are not easily controlled. The toxic effects are quickly overcome by the intravenous use of 0.5 to 1.0 mg. of atropine. Neostigmine is so far superior to acetylcholine, mecholyl or doryl in the treatment of myasthenia gravis that these drugs are no longer used except in experimental investigations.

Many endocrine preparations have been tried in the treatment of myasthenia gravis without affecting either the symptoms immediately or changing the natural course of the disease. The anterior pituitary hormones have been fully investigated, as well as thyroid and thymus extract and adrenal cortical substances. The adrenotropic factor in the anterior pituitary is now under clinical trial. As myasthenia gravis shows a strong tendency to spontaneous remissions and relapses, fluctuations in relation to menstruation and pregnancy and some hypothetical relation to the thymus gland, an endocrine factor in the disease is reasonably certain. No therapeutic measures, however, based on endocrines have been sufficiently promising to justify their continued use. Thymectomy too has been disappointing. Some relief has been afforded to a few patients, usually consisting in their ability to be adequately maintained on less neostigmine than before the operation. In a few instances thymectomy has been followed by complete remission; in many, no change has occurred. Patients are not made worse by thymectomy, but the operative mortality is high (10 to 25 per cent) and the results are so equivocal that fewer operations are now being done than three or four years ago. Patients with thymomas did not do better after thymectomy than persons with normal or slightly hypertrophic glands. Complete remissions of spontaneous origin, moreover, are not unknown in the natural course of the disease, thus making any evaluation of treatment, medical or surgical, a hazardous procedure.

References:

Schlezinger, N. S.: Evaluation of Therapy in Myasthenia Gravis, *Arch. Int. Med.* **65**: 60 (Jan.) 1940.
Richter, R.: Management of Myasthenia Gravis, *M. Clin. North America* **29**: 126 (Jan.) 1945.
Viets, H. R.: Myasthenia Gravis, THE JOURNAL, April 28, 1945, p. 1069.
Comroe, J. H., Jr., and others: The Effect of Di-Isopropyl-Fluorophosphate on Patients with Myasthenia Gravis, *Am. J. M. Sc.* **212**: 641 (Dec.) 1946.

FLUORESCENCE OF NAILS

To the Editor:—It has been reported (Ginsberg, Julius E., and Shallenberger, Paul L.: Wood's Light Fluorescence Phenomenon in Quinacrine Medication (The Journal, July 6, 1946, p. 808) that following discontinuance of quinacrine therapy the characteristic greenish yellow fluorescence exhibited by the nails beneath Wood's light disappears last from the nail of the great toe. Can this be explained on the basis of differential rates of growth of the various toenails, or is an additional factor involved?

W. Q. Wolfson, M.D., Chicago.

ANSWER.—The explanation of this phenomenon is believed to be on the basis of the different rates of growth of the different nails. The fluorescence appears to disappear from the proximal portion of the nail within a month or two after quinacrine is stopped. As time goes on this clear proximal portion becomes greater and gradually results in a fading distal fluorescence. It is felt that if absorption of quinacrine from the nail had occurred, the fading process would have involved the entire nail instead of having its origin and end result as reported.

It seems to have been established in human beings that there is some gradation of growth rate in the various nails of the body and that the great toe, being the largest nail and usually the thickest, probably has the slowest rate of growth. In addition to the foregoing comments, the inquirer may be interested in referring to a previous article on this subject entitled "Unusual Pigmentation Developing After Prolonged Suppressive Therapy with Quinacrine Hydrochloride," by Lutterloh and Shallenberger (*Arch. Dermat. & Syph.* **53**:349 [April] 1946). In this study the deposits of quinacrine were observed to remain in relatively the same spot where they originally occurred. The interpretation of this was that the pigment had been deposited in the nail bed rather than in the nail itself. It was accordingly believed that the fluorescence is a phenomenon of diffuse drug distribution while the pigmentation is most likely a result of periodicity and irregularity in the amounts of drug dosage. In other words, the fluctuation of the drug dosage of from one to ten tablets a day would result in widely different heights of blood level, saturation and resultant pigment deposit.

EFFECT OF DRUGS ADDED TO ALCOHOLIC BEVERAGE

To the Editor:—1. What are the probable effects of adding a barbiturate to an alcoholic drink (i. e., doping a whisky and soda)? 2. What might be the expected results if a drink (alcoholic) was doctored with ¼ grain (0.016 Gm.) of a hypodermic tablet of morphine sulfate? morphine tartrate syrette? cocaine? 3. What might be the expected result if the doctoring agent was acetylsalicylic acid? 4. Are there any simple tests to determine what agent might have been used in a case of suspected doping of an alcoholic drink with a small quantity of the "doctoring agent" (to differentiate those listed in 1, 2 and 3)?

Capt. John E. Newland, M. C., United States Army.

ANSWER.—It is difficult to answer these questions specifically since the total dosage of the drug ingested and the quantity of alcohol imbibed are variants which influence the end result.

There is no satisfactory evidence to indicate that the addition of any of the substances mentioned to whisky and soda (the average 6 ounce [180 cc.] drink, representing a 10 to 15 per cent hydroalcoholic solution) would significantly alter the ordinary pharmacologic action of the various compounds. The soluble barbiturates and the salts of morphine and cocaine would dissolve and contribute a bitter taste to the solution which could be detected by the experienced drinker. Acetylsalicylic acid would dissolve with difficulty but would be more difficult to detect.

The barbiturates and morphine would summate with alcohol to contribute to its depressant effect at any level of dosage of the drug or quantity of alcohol imbibed and hence to reduce the quantity required to paralyze respiration.

In a general way cocaine would tend to antagonize the depressant effects of moderate quantities of alcohol and would contribute to the excitement stage. Any large quantity of this drug would contribute to cardiovascular failure because of its cardiotoxic action.

Acetylsalicylic acid in moderate quantities (up to 1 Gm.) would not have any characteristic additive or antagonistic action to alcohol. In large quantities it would probably contribute to an early circulatory collapse in the drunken state.

A simple, accurate chemical test for the substances in question is not available. Unless the correspondent is prepared to conduct rather elaborate chemical procedures, details of which may be found in any standard work on toxicology, it would be well to place the suspected material in the hands of a competent toxicologist, especially if such a case might have mediocolegal implications.

HYPNAGOGIC HALLUCINATIONS

To the Editor:—A young woman of a somewhat tense and nervous disposition complains of flashes of light or occasionally vivid visual hallucinations of faces or scenes which are prone to occur in the drowsy state which precedes sleep. This disturbance occurs especially when there has been much nervous stress and strain during the same day. Physical examination is negative. Please discuss the nature and significance of this phenomenon.

M.D., Illinois.

ANSWER.—Hallucinations are mental impressions of sensory vividness that occur without known external stimulus. They are distinguished from illusions, which are similar impressions depending on misinterpretations of an external stimulus.

Hallucinations may be psychogenic or physiogenic in origin. They may occur in toxic states and in brain lesions but most commonly are psychogenically induced. Hallucinations may occur on rare occasions in normal people.

The patient described in the query appears to have hypnagogic hallucinations that characteristically occur in the state just between sleeping and waking. They usually have an accompanying sensation of drowsiness, a characteristic dreamlike quality, and the person who experiences them usually realizes their hallucinatory nature. These are apt to occur at some time in the life of any persons and generally may be said to have psychologic significance similar to that attributed to dreams.

VENESECTION AND HYPERTENSION

To the Editor:—I should like an opinion with regard to venesection (500 cc.) in cases of essential hypertension. Is it ever indicated prior to the appearance of congestive failure with pulmonary edema? Is it ever used as a prophylaxis against impending cerebral hemorrhage?

M.D., Pennsylvania.

ANSWER.—Venesection in hypertensive disease is rarely indicated and frequently is emphatically contraindicated. In acute congestive heart failure with venous hypertension and pulmonary edema phlebotomy of 500 cc. may be a life saving measure as a temporary expedient while oxygen inhalation apparatus is being obtained and before rapid digitalization is possible. As criteria for determining impending cerebral hemorrhage are not adequate, venesection cannot be justified as a prophylactic measure. In the rare instances of arterial hypertension secondary to polycythemia vera, repeated venesections are legitimate and often useful.

Arterial hypertension, with the single rare exception of that associated with polycythemia, is not due to an abnormally large blood volume but to arteriolar constriction, either spastic or arteriolarsclerotic. In many instances hypertension is associated with anemia, often of considerable degree. In such cases therapy to correct the anemia commonly results in considerable reduction of the hypertension. Obviously, further exacerbation of such anemia by venesection is undesirable. The chronic damage done by hypertension arises from interference with the nutrition and respiration of parenchymatous cells. In hypertensive crises with anginoid pain or evidences of cerebral ischemia, vasodilating drugs are both safer and more effective than venesection. The hypertensive patient needs all the oxygen carrying capacity that an optimal hemoglobin content can give him.

INFECTION OF BARTHOLIN GLAND

To the Editor:—A married woman aged 40 has an acute cystic condition of the bartholin gland about ¾ inch (1.9 cm.) in diameter and 1½ inches (3.8 cm.) in depth. There is no history of trauma, and the patient denies any venereal history. The patient states that she had a hard dry stool, which caused her to do much straining in evacuating the bowel. The swelling of the bartholin gland appeared about four hours after straining took place. The patient was given 400,000 units of penicillin in divided doses in the first twenty-four hours after the swelling was noticed. This caused an immediate subsidence of all symptoms, except that the mass remained about the same in size. Would this quantity of penicillin sterilize the cystic content? What would be the possible etiology? Is excision of the affected gland the ideal solution?

M.D., California.

ANSWER.—It would be difficult to say whether the penicillin has sterilized the cyst. Since the patient does not give a history of venereal infection it would appear that the etiology would be a nonspecific infection. The ideal treatment is excision of the cyst.

MALE SEX HORMONE IN FUNCTIONAL UTERINE BLEEDING

To the Editor:—Can you tell me the physiologic action of male sex hormone in the treatment of functional bleeding in women?

Warren A. Lapp, M.D., Cincinnati.

ANSWER.—The exact physiologic action of the male sex hormone in the control of functional uterine bleeding is not known, but there are at least two factors involved, one of which concerns the myometrium and the other the pituitary gland. In the opinion of Sturgis, Abarbanel and Nader (*Am. J. Obst. & Gynec.* **39**:102 [Jan.] 1940) the action of testosterone is first of all inhibition of rhythmic intermittent contractility, thus lessening the volume flow of blood to the uterus. Second, by its direct action on the myometrial elements the volume flow of blood in the myometrium is reduced. The net results is a diminution in the flow of blood to the endometrium, with a consequent reduction in the amount of uterine bleeding. In commenting on this article, Greenhill (Year Book of Obstetrics and Gynecology, 1940, p. 513) remarks that this theory does not take into consideration the suppression of the pituitary gland by testosterone propionate with subsequent diminution of ovarian function, which may account for the control of uterine bleeding.

VITAMIN B COMPLEX AND ESTROGENS

To the Editor:—Does vitamin B complex suppress the estrogenic function in women and will its prolonged use hasten the menopause or upset the libido?

M.D., Columbia, South Carolina.

ANSWER.—Vitamin B complex has little direct effect on the secretion of estrogens or the physiologic action of these substances. The B vitamins do, however, have a significant effect on the maintenance of the proper balance of estrogens in the body through regulating the normal metabolic functions of the liver. Thus where the liver contains insufficient amounts of vitamin B complex the metabolic destruction of the estrogens is lessened, and a relative excess of estrogens circulating in the blood stream may occur which can induce certain changes in the tissues typical of hyperestrogenism. Among these changes are hyperplasia of the endometrium, cystic mastitis, abnormal uterine bleeding, premenstrual tension and amenorrhea (Biskind, M. S.; Biskind, G. R., and Biskind, L. H.: *Surg., Gynec. & Obst.* **78**: 49 [Jan.] 1944). When vitamin B complex is administered in large doses the liver regains its normal function of metabolizing estrogens, and these conditions are corrected. The prolonged use of vitamin B complex will not produce ovarian dysfunction and therefore will not hasten the menopause. It is doubtful that the libido would be diminished by the administration of B complex.

PREVENTION OF DERMATITIS IN RUBBER MANUFACTURE

To the Editor:—Many employees complain of what they call "rubber poisoning." This is a "carry-over" of old ideas among workers. How can I minimize contact dermatitis in rubber manufacturing plants?

Floyd M. Burgeson, M.D., Des Moines, Iowa.

ANSWER.—"Rubber poisoning" is a term applied by rubber workers to whatever illness or dermatitis they think is due to their occupational environment. Many of these conditions are not due to rubber or its compounds, and some of them are not even of occupational origin. The criteria for making a diagnosis of occupational dermatitis will be found in Schwartz, Louis, and Tulipan, Louis: Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939, pages 51-61.

The prevention of dermatitis in rubber manufacture has for its theme the prevention of contact with irritant chemicals. This is accomplished by efficient general and local ventilation devices, by furnishing the workers daily with clean protective clothing and by enforcing personal and environmental cleanliness. In some instances protective ointments may be of value.

Further information is given by Schwartz and Tulipan on pages 385-386, and by Louis Schwartz (Skin Hazards in the Manufacture and Processing of Synthetic Rubber, THE JOURNAL, Feb. 17, 1945, p. 389).

BLOOD PICTURE IN LATE PREGNANCY AND PUERPERIUM

To the Editor:—What are the accepted figures for hemoglobin content and red blood cell count for women in the ninth month of pregnancy and for the first two postpartum weeks?

Erwin Neter, M.D., Buffalo.

ANSWER.—Dieckmann and Wegner published the best available figures for the blood constituents in normal pregnancy:

	Hemoglobin	Cell Volume	Cell Count
38 weeks gestation	12 Gm.	38.3 per cent	4.23 million
2 weeks post partum	11.9 Gm	37.7 per cent	4.44 million

They found that there is a decline in the hemoglobin per hundred cubic centimeters of blood during pregnancy, reaching a maximum of about 15 per cent at the twenty-sixth to the thirty-fifth week of gestation. There is a comparable decrease in the hematocrit, which reaches a maximum of about 14 per cent. However, the total amount of hemoglobin and the total hematocrit increase during pregnancy as a result of the increase in total blood volume.

Reference:

Dieckmann, W. J., and Wegner, C. R.: Studies of the Blood in Normal Pregnancy: II. Hemoglobin, Hematocrit and Erythrocyte Determinations and Total Amount of Variations of Each, *Arch. Int. Med.* **53:** 188 (Feb.) 1934.

EFFECTS OF VASECTOMY AND LIGATION OF OVIDUCTS

To the Editor:—Please discuss the possible injurious effects (sexually or otherwise) of tying off the vas to prevent conception and of tying off the tubes in a case in which further pregnancies are definitely contraindicated. The man in the case fears aging of his faculties; the woman knows that abdominal section is not without danger.

Paul W. Van Metre, M.D., Rockwell City, Iowa.

ANSWER.—The only injurious effect in doing a bilateral vasectomy is that the man becomes sterile. At one time it was thought that a vasectomy improved the libido, but now investigators have definitely established that this is not true. The same statement applies to tying off the oviducts. There are some states, however, which have laws forbidding the sterilization of men, and it would be well to consult the laws of the state before any procedure is considered.

UNDULANT FEVER AND BLOOD SEDIMENTATION RATE

To the Editor:—Please discuss the effect of brucellosis in its various forms and stages on the sedimentation rate.

M.D., Georgia.

ANSWER.—The data that might supply even a fraction of the answer that is implicit in this question are not available. The little knowledge that is available suggests that the results of this nonspecific test, if they were to be accumulated in sufficient quantity, would not distribute in accordance with the recognized forms and stages of brucellosis but rather with relation to the location, size, nature and state of activation of regional brucella localizations which may occur in practically any tissue or organ of the body, and at any stage of any recognized clinical form of the disease.

FECAL FISTULAS FOLLOWING APPENDECTOMY

To the Editor:—I have just operated on a patient who presented symptoms and signs postoperatively that lead me to believe that he had a "blow-out" of his appendical stump following appendectomy. The appendix was not acutely inflamed but was adherent to the cecum, with its tip buried in the posterior parietal peritoneum. More than average difficulty was encountered in removing the appendix. The stump was buried without ligation with a Parker-Kerr stitch. On the second postoperative day he developed severe pain in the operative region and symptoms of localized peritonitis. On the fifth postoperative day he developed a fecal fistula. I have decided that the buried stump of the appendix "blew out" as the result of poor circulation on the wall of the cecum due to excessive manipulation in removing the appendix. What is the incidence of this sort of complication?

Thomas W. Kredel, M.D. Indiana, Pa.

ANSWER.—Postoperative fecal fistulas following appendectomy have resulted from (1) vascular thrombosis and infection of the cecal wall with necrosis, (2) pressure on the intestinal wall from drainage tubes and other objects, (3) cutting off of the blood supply to the cecum by tight purse-string sutures, (4) operative difficulties resulting in necrosis of the bowel and (5) other less common causes, such as blowing out of the appendical stump, inadvertently cutting the ligature of the stump or the purse-string suture or inflammatory or neoplastic diseases of the cecum.

There are three main surgical procedures for dealing with the stump of the appendix: (1) simple ligation, (2) ligation of the stump and inversion with a purse-string suture and (3) inversion of the stump without ligation. The generally accepted figure for fistulas following appendectomy with all procedures is roughly 4 per cent. Throughout the literature series have been reported in which the figures are both higher and lower. One report of 3,000 cases showed an incidence of only 1.4 per cent. Others range up to as high as 15 per cent. In 4,655 cases Deaver reported an incidence of 4.7 per cent, but these were mainly confined to those which had perforated and had abscess formation requiring drainage.

The case outlined in the query falls into a rather special classification. The fact that the appendix was not acutely inflamed and the fact that the stump was inverted without ligation would negate some of the causes of fistula formation. Statistics on this class are rare. The figures which would fit the case most closely are reported from Lexer's clinic by Burkle-de la Camp. In 3,200 cases of appendectomy performed by inversion without ligation of the stump, no fecal fistulas developed.

ANTHOCYANINURIA

To the Editor:—Can beets, especially Harvard beets, tint or color the urine a blood red?

M.D., New York.

ANSWER.—The ingestion of beets occasionally may cause the urine to be colored by an abnormal pigment. This condition, anthocyaninuria, may be confused with hemoglobinuria. This pigment, an anthocyanin, can be distinguished easily from blood by the fact that it is pink in acid and yellow in an alkaline solution. According to one study (Ruh, H. O., and Garvin, J. A.: *Ohio State M. J.* **20:**763 [Dec.] 1924) young beets, because of a greater pigment content, more frequently produce this effect than old beets. Anthocyaninemia may also occur, according to the authors mentioned. Other case reports of this condition are given by:

Mathison, Abe: Anthocyaninuria, abstr. *Am. J. Dis. Child.* **51:** 226 (Jan.) 1936.
Poole, M. W.: Anthocyaninuria, *ibid.* **33:** 784 (May) 1927.
Anthocyaninuria, *Bull. Soc. Pediat. de Paris* **36:** 266, 1938; **37:** 88, 1939.
Anthocyaninuria, editorial, THE JOURNAL, June 25, 1927, p. 2036.

HEMILATERAL PERSPIRATION

To the Editor:—What might make a man perspire on one side of his body and not on the other?

Paul R. Hahn, M.D., Racine, Wis.

ANSWER.—The inquirer does not state whether the entire side is affected or how long the trouble has been present; neither does he state clearly whether there is a lack of perspiration on one side or an increase on the other. If one entire side is affected, then the probability is that the trouble lies in the hypothalamus. If only part of that side is involved, especially the trunk and the extremities, the site of involvement may be with the cord. There may be an inborn developmental difficulty, in which case the sweat abnormality has been present during the entire lifetime of the individual. Under these circumstances it would be worth while to have the patient consult a neurologist. A few persons perspire freely over some localized site, usually on one side, after the ingestion of certain foods such as chocolate or nuts. Inquiry should be made concerning such relationship. Since desensitizing methods have not proved useful, the patient would have to give up any food incriminated.